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Dalton and Atlanta, Ga.

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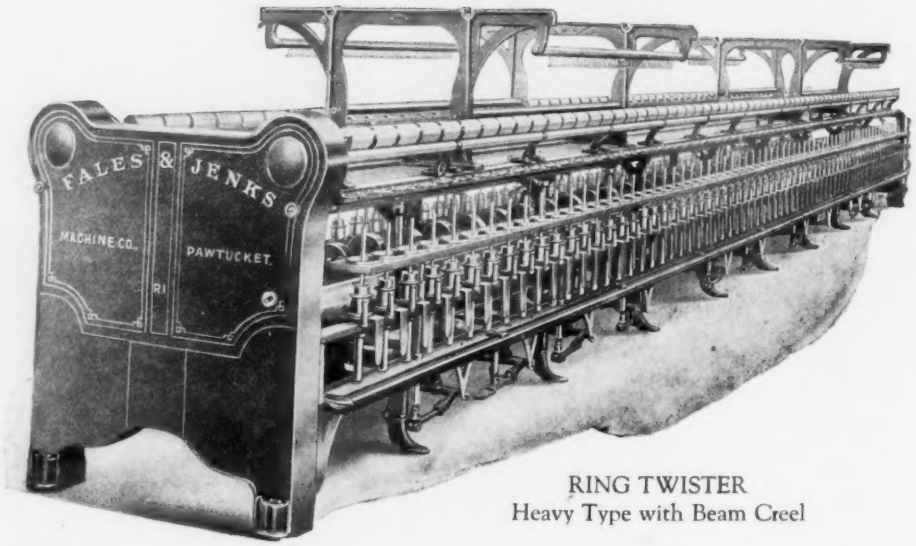

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COTTON

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Nineteen-Twenty-Five

INDICATIONS for the coming year point to increased production and greater prosperity in every industry. To be adequately prepared for increased business, you will want to select dependable sources of supply for all your raw materials.

Our large modern plants at Niagara Falls, N. Y., and Saltville, Va., an active traffic department and our own warehouse stocks at forty-two convenient distributing points make up a complete service that insures prompt deliveries to our customers in any quantity.

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With the Publishers—

Putting You in Touch With Good Ideas.

An enthusiastic young colleague leaned over our busy desk to cry, "Have you seen the Hoozis Players? Oh, you must go and see them! Nobody should miss the Hoozis Art Players! You ought to go!"

"Sir," we retorted, "I never go to see anything that I **ought** to go and see."

Isn't that human nature—from childhood up? Haven't you felt that way yourself many times?

It is fighting against this common tendency to give advice, to tell the readers what they ought to do, that keeps the editors of COTTON busy reminding themselves of the object of the paper, which is:

"To put textile men **in touch** with the newest and best ideas in the textile industry."

As a rule we try to follow the example of a well-known advertising man, about whom one of his fellows said, "He is never particularly strenuous about the acceptance of his ideas."

We try to tell simply and comprehensively what is going on in the textile industry—how mills are cutting costs by increasing production, saving waste, and turning out better work with the least possible trouble. That's what operating executives want to know and they can then formulate most of their own conclusions.

Getting the sources organized for securing that material and presenting it in an attractive form to save time for busy executives is a job in itself. It's considerable of a task to line up things so that we can put the textile man who has a difficult problem **in touch** with the experiences of a man or company which has solved that very thing.

But even after we have organized this material the man who needs assistance can not get **in touch** with the remedy unless he reads COTTON regularly. It is there, but like the radio you have to tune in upon it.

And the advertisers in COTTON are working in common with the editors and the textile men. They are constantly trying to put **in touch** the mills that are working under a handicap and the materials that have overcome such handicaps for other mills. Their aim is not to dazzle or astonish, but to present in a business-like way the equipment and supplies that have put many mills **in touch** with that most desirable feeling—a smooth-running, producing, prosperous mill.

When COTTON and its advertisers can tell of the developments of the industry in such a convincing manner as to wipe out the customary distinctive line between the things you **ought** to do and the things you **like** to do, then we're getting along with the main job—not to be faultless but to be interesting in the work of keeping men and ideas **in touch** with one another.

AMONG COTTON'S READERS

A. W. McLellan, President,

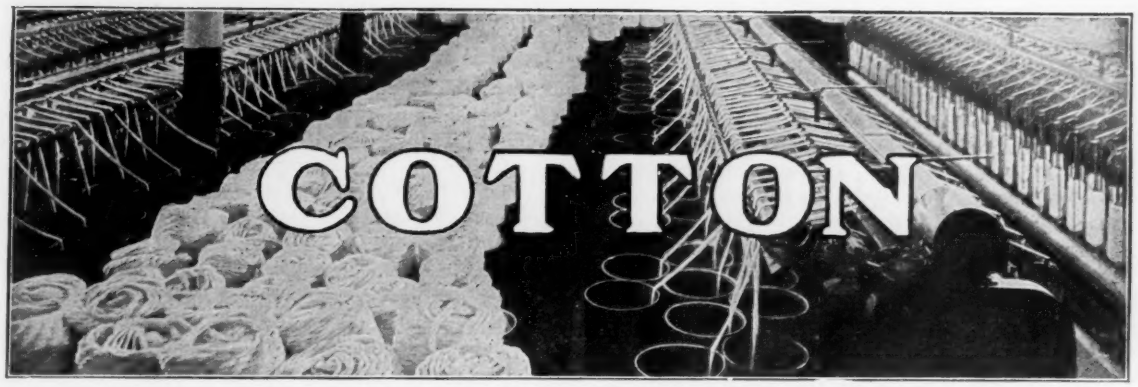
Alden Mills,

New Orleans, Louisiana.

President American Cotton Manufacturers' Association.

"We read each and every copy of COTTON, and I understand that it is read throughout both of our mills. I consider it the most interesting and desirable of the textile publications that we receive, and I feel that it is actually necessary for our superintendent and foremen to have it at their disposal so as to keep fully posted on the latest developments in machinery, and the latest methods to successfully get results in their various departments."

A W McLellan



January, Nineteen-Twenty-Five

A Year That Should Begin a New Era.

There has been a long time since a new year began so auspiciously as the one that will be recorded as A. D. 1925. Not for a decade or more has the beginning of a year been marked by so few discernible uncertainties, so much promise for progress, or a better outlook for happiness and prosperity in high degree. The world evidently is back on its feet and once more is able to maintain its equilibrium. This applies to all of the basic equations, business, politics, general thought and the common mood.

It is now ten and a half years, since the boom of German cannon set people throughout the world to groping for the unknowable, and brought on a period of destruction, upturning, hysteria, and, in large degree, chaos.

Nothing ever better demonstrated the infinite resources of human will and initiative than did the quick adjustment of the world to a state of war that in nearly every aspect was without precedent. During the four years of the war's continuance there was recurring demand for unprecedented readjustments, which in practically every case was made with success.

The aftermath proved more difficult and in many ways more puzzling than did the Olympian struggle. Getting back to peace was a harder task than the achievement and the conduct of war.

For the war left humanity in a condition of shell shock. In meeting its tremendous exactions, Governments were forced to draw to the limit on their reserves. The end found those who govern exhausted, with little strength to array against the emotional surgings of masses blinded and maddened by the terrible experience. Business had to deal with a world map radically changed, with many of the old bases of operations gone and the new ones not even well defined.

Yet during the last six years there has been a steady come-back. In despite of the heavings which at times seemed to bode disaster, the storm passed; the ship of civilization weathered it without suffering any evident permanent injury.

So now, from all reliable indications, "normalcy" prevails largely throughout the world, and especially in the United States.

This is shown notably by the political trend. Less than a year ago, politics in the leading nations of the West seemed to be drifting to the left. Even sturdy Great Britain entrusted its government to a group of radical theorists. France's government passed into the hands of a crowd that was even more extreme. Italy and Spain were saved only by bold assertions of autocracy. Germany, bled white by the war and denied infusions, seemed headed towards something akin to death.

In this country, rampant radicalism felt that it's day had arrived and resolved on an attempt to stand and walk alone.

Then the better sense of Great Britain and the United States rallied and revolution was dealt deadly blows in both countries.

Even France, the most shell-shocked of the nations, has begun to display some of the good sense that makes that country dear to all readers of history. Germany likewise has shown that the war did not drain from its people the capacity for patience and industry which has raised them, many times in the past, from ruin to greatness, as it will do again.

Trade, always running ahead of politics, recovered much of the stability that the war and its aftermath destroyed.

Hence the close of 1924 was marked by a financial boom that startled even the most optimistic. Whether it pressaged the future correctly is of course beyond positive assertion but it of itself is strong evidence that it did. And other evidences confirm this.

The indications are that conditions as a whole will be good for a reasonably long time to come. The people of this and other countries now evidently want to get down to business, to get to work, to build and rebuild—for a change, if for nothing more. They are satiated with agitation, particularly that having to do with "isms," strange notions and vague speculations. During the last fifteen years they have seen too many of them prove, in practice, to be futile to have left much taste for them.

The old ways, the old types of leaders, are to be given another chance, and apparently a free and unhampered one, to put civilization forward. Individualism is to have another day. How long it will be depends upon how it is used.

Let us hope that this period will be properly used, that those who run things will not quickly forget the quagmires they have escaped, and thus perpetuate the length of and enlarge the opportunity that is now being given them.

One truth has been demonstrated by the last fifteen years of national and world experience. It is that the institution we call government can not do all things, or do

many, except merely to govern, successfully.

If the conservative thoughtful elements that now beyond all question have charge of affairs, copy from the tactics of those who are radically or adventurous minded and turn to the government as a universal solvent whenever a difficulty arises, this era will not be of long endurance.

Governments have had their chance and have in great part failed. For at least sometime to come, all thoughtful minds should favor virtually everything that tends to curb governmental operations, which have been greatly and in most part futilly expanded.

Let retrenchment in politics and government with expansion in business and industry be the guiding slogan, and a long era of progress and prosperity will be assured.

Herbert Hoover, Stabilizer Extraordinary.

As this is written it seems that the personnel of President Coolidge's cabinet will remain largely as it is after March 4th. As a whole this personnel is good, but the continuance of one of its members should be pleasing to all persons who put performance above display. This member is Herbert Hoover, Secretary of the Department of Commerce.

It still is impossible to think of Hoover without associating him with the notable war work that raised him, an unknown mining engineer, to world prominence. His later renown has suffered from this fact, for his humdrum work in the most humdrum of governmental departments could not possibly show up so spectacularly as the feeding of Belgium or the rulership of the American kitchen during our war activity, to say nothing of the A R A.

Yet in this humdrum undertaking Hoover probably has rendered even greater service than in the fields which made him famous during the war. That he has done naught to inject into it that spectacularity which, in his former positions he could not escape, really is a proof of his greatness.

Secretary Hoover has made of the Department of Commerce a live and harmonious integument of American business practice and conduct. He has proved that the government can help best only when it assists others to help themselves. No man in the government has been more opposed to autocratic interference and none has caused the government to bring about more constructive achievements. He has made the foreign trade branches of his department invaluable adjuncts to the export and import trades. His success in promoting the adoption, voluntarily and by mutual agreement, of simpler practices in numerous domestic trades should save, in the end, hundreds of millions of dollars hitherto wasted on account of needless faults that grow up under competitive systems of doing business.

That the government in achieving great ends doesn't necessarily have to possess the power to compel and police is a truth that he has proved. This should be of worth incalculably beyond any money savings or trade expansions which may result from his efforts.

For ten years this man, who no doubt would derive more personal satisfaction in the pursuit of his profession, has given his time to the public—time that he might have turned into huge earnings.

And he has given it largely out of the fullness of his heart, for many things weigh against any higher ambition in politics which Hoover may have.

A letter to him, or to President Coolidge, expressing appreciation of Hoover's continuance in the cabinet, would be a timely act on the part of any thoughtful American.

The "Amending" Fever Wanes.

Historians of the Constitution of the United States point out that meddling with that document has run in waves or "epidemics."

The first came immediately after the adoption of the Constitution, when the amendments embodying the bill of rights were added. These, in truth, were not amendments but, rather, supplementary additions which grew out of actions having to do with ratification. They tended to take from more than to expand the written fundamental law of the nation.

The next wave followed the Civil War, when the tide of centralization that was first started forward by Hamilton and Marshall partook of a sweep which not yet has clearly subsided. It caused the thirteenth, fourteenth and fifteenth amendments to be written into the Constitution, the last two being largely futile and now rated by nearly all students as in great part wrong.

More than a half century elapsed before the third tide set in. It began about fifteen years ago, with the sixteenth, or income tax amendment, which few thought would be, but which was, ratified. The ease with which it went over caused this third tide to become of the nature of a fever. Since then scores of proposed amendments have been urged —nearly a hundred now pend in Congress.

While this "amending epidemic" raged, a total of four amendments were submitted by Congress and ratified by the States, including those calling for the popular election of United States Senators, woman suffrage and national prohibition—all, like the income tax amendments, of more far-reaching significance than was anticipated by either advocates or opponents. One other was submitted—the so-called "child labor" amendment which now is before the States.

It now seems highly probable that the last one will be rejected, or, rather, that it will not be ratified now.

The indication is that this latest tide or fever for amending the Constitution has run its course, and that those who would "reform" in this dangerous way must find other and less risky processes.

Even if this be so, there are two important considerations having to do with amending the Constitution which should be kept to the front by those who may be pleased with this situation.

Both have to do with the process of ratifying amendments, which beyond all question is faulty and abets these feverish movements.

While no amendment becomes a part of the Constitution until ratified by three-fourths of the States, it is not certain that one submitted goes into the discard when rejeced by one-fourth or more of the States.

This uncertainty is due largely to the fact that no proposed amendment ever has been positively rejected. Four proposed ones, submitted long ago, were neither ratified nor rejected; they still are "out" as it were. Either changed conditions or lack of interest kept most of the State legislatures from so much as acting on them.

A legislature probably can reconsider and reverse its action on an amendment while it still pends—but, unless

ratified, does an amendment pend forever, or until it is accepted by the States?

Some advocates of the pending amendment claim that it does. These say that no matter how many State legislatures rejected the so-called "child labor" amendment the fight for its ratification will go on until won—that is, they propose to pester the legislatures and the public until what they ask will be done as the only means of getting rid of them.

This contention probably is wrong, but the question should be settled; and this is a good time for the States to see that it is settled. If ratifications are binding and rejections are not, the submission of amendments is an all but useless procedure.

Before the "amending fever" subsides completely there should be adopted one other for the purpose of clearing up and tightening up the process of consideration by the States. This should require that these proposals be referred to the voters in each State, or that there intervene between submission and legislative action at least sufficient time for the voters to take the matter in consideration when electing members of legislatures.

The four amendments added to the Constitution in recent years were, in each case, ratified in most part by legislatures which were chosen before the proposals were submitted.

An amendment making this condition impossible now pends in Congress. An addition to it putting a time limit on the pending of all amendments, or a statute making it clear that when one-fourth or more of the legislatures reject an amendment it can not be ratified unless resubmitted, likewise would be apropos.

Southern Textile Diversification

BY FREDERICK H. McDONALD

PRESIDENT, MCDONALD AND COMPANY, ENGINEERS, ATLANTA, GEORGIA.

By diversification is meant the rapidly growing tendency of the southern textile industry to change over from its previous, practically single line, the occupation of turning out staple, almost totally rough and coarse goods, that has so long led the South to be looked upon as a primary producer in the textile yarn and goods industry. This article will deal, roughly, with the causes that are leading up to this change, some of the products that are being produced, and a diagnosis of just what effect this trend may have, not only upon the southern cotton industry, but on the national industry, and, to a certain degree, upon the foreign branch of the industry.

It is the tendency in pioneer countries or territories to deal largely in raw materials. This is due not only to a perfectly natural condition where an undeveloped territory must essentially traffic in the most quickly realized-upon form of product, but also to the fact that undeveloped territory seldom has within it skilled managerial producers of the more refined products, or skilled labor that can turn these products out, or even—which is a very strong influencing factor—a ready market for the finer grades of materials.

In many ways the South is far from being a pioneer country. Yet, because of its long dependence upon agriculture as a source of income, and because also of its, until recently, exclusive tendency to engage only in the production of cotton as a money source of crop income, the South is, from an industrial standpoint, almost as much a pioneer territory as the Far West, in the days of '49 was, as regards agriculture.

The East, on the other hand, has long been at the other extreme regarding industrial development. We find north of the Ohio River a greater degree of concentration of skilled workers, mechanics and leaders, as well as a larger population already educated to the consumption of the finer grades of goods, than exists anywhere else in the world. Not only does this apply to the textile industry as regards the production of yarns and fabrics, but it applies in the converting of fabrics into useable products, as well as to tools, machines, household goods and luxuries.

A number of fundamental causes are making it necessary for the South to not only diversify agriculturally, but to seek that far more profitable form of variation which is the diversification of human energy. We find an area hitherto regarded as essentially agricultural, now being searched and developed because of its vast natural resources and manufacturing advantages due to a number of favorable, hitherto unexploited characteristics as regards labor, power, transportation, climate and nearness to readily producable raw material. The South at present occupies a very advantageous position when it comes to the manufacture of many articles as compared to their present cost of manufacture and distribution in the East.

To these sectional changes and possibilities must be added the far greater fundamental change that is heaving like a ground swell through all industry, i.e., a gradual breaking away by industry from the concentration of manufacture which the Northeast and the surrounding territory has for generations enjoyed. This slow decentralization, even now on the basis of the 1920 census, is moving the center of manufacturing activity westward and south much more rapidly than even the center of population itself is moving. The manufacturing center for the entire nation, being now as far west as central Indiana, already overtaking the population center spotted now in Ohio.

The causes of this movement while manifold can be summarized perfectly in the single word "price," meaning by this the cost of a given article to the ultimate consumer.

Regardless of whether an over-capacity of manufacturing production exists in the United States—a question much mooted at present—there is certainly something closely akin to under-consumption. For several years that great safety valve of national production, the foreign market, has been either very sluggish or entirely closed. Our own domestic consumer, either because he has been made wary by the immediate post-war economic squeezes, or perhaps because there may after all be some such fundamental national characteristic that can be described as a trait closely akin to thrift, there has been a decrease in the total consumed volume of goods in this country that has put many mills entirely out of production, and has caused numbers to go into part-time production. This condition when matched

with an extremely large producing capacity, has practically flooded the American market with every character of manufactured product, leading to a highly competitive warfare among distributors to obtain for their own products what they consider their share of potential business. This has made a predetermined setting of prices a practical impossibility. The manufacturer has been forced to accept, not only the normal competitive lowering of prices, but has been under the necessity of making, even in a fairly discriminating market, his *price* the attraction for purchase.

This tendency on the part of the consumer may also be accounted for by the fact that the war years, because of an increased individual income, saw a raising of the individual standard of desire to a much higher level than our previous economic condition had ever permitted the individual to conceive. Everybody, these days, from the laborer to the retired capitalist *wants* only the best. In the absence of his ability to obtain the best in quality, he insists on something approaching the best in appearance which his individual finances will permit his purchasing. We find ourselves, therefore, in an era where the old-time, staple articles are far in the background as being much too ordinary for nominal consumption and use. This has led to a rather hectic production of substitutes for the finer fabrics, and we today have all kinds of mixtures of raw materials, weaves and colors in an attempt to invest the inferior quality of goods with the appearance of the finer, prohibitively priced goods.

Thus cotton dresses, hosiery, suitings and outer garments are suffering from a decided inferiority complex, and mixtures of wool, cotton, silk and, most important, artificial silk, almost controlling the distributive market.

We find, therefore, that the diversification in which the South is now indulging in the manufacture of textile products is due to the fundamental necessity of cheapening the cost of production, as well as to the great necessity on the part of the manufacturer to cater to current style demands which are now running the gamut of every available type of fancy, dressy and even flashy product.

There is another trend, found in individual industrial organizations, to which the present change in the application of manufacturing to textiles in the South may be compared. This is the great tendency of many large-size organizations to either consolidate, acquire or create a chain of separate but serially connected lines of activity, and to engage in what is now termed vertical consolidation.

This movement is typified in the United States Steel Corporation, and to a more distinctive degree in the activities of Mr. Ford. Both these companies not only produce the basic raw materials entering into their products, but control all of the tributary factors such as transportation, power, etc., that enable the entire process of changing a basic raw material to a finished product to be entirely controlled in all of its phases. Mr. Ford is particularly an outstanding example of this, as he not only deals with one, but all of the basic materials entering into a very refined and completely finished product ready for delivery to the consumers' door—a process controlled by the Ford organization in every step, even, at times, to the individual financing of the purchaser.

This tendency, which might be called territorial vertical production, very aptly illustrates the gradual change in lines of production in the textile industry in the South. We have here the natural, and for the United States, the monopolized control of one of the basic textile fibers. The South started its cotton manufacturing activities by merely preparing the raw fiber for market. Aside from family consumption, yarns were the only manufactured product produced for a long time; gradually the coarser forms of grey goods were made, but were exported either to New England or abroad for conversion into finer articles. It has been a perfectly logical step that to an increasing degree the South should gradually begin, itself, to use and to convert its own raw product and raw goods into, first, the coarser grades of finished goods, and then, as now, to finally participate in the production of the very finest of finished fabrics of every description.

The growing wealth of the South with the concurrent ability to build up reservoirs of stored and available capital, has made it possible for the South itself to largely control its own requirements in finances. We thus see a sectional application of the principal of entire control of production illustrated by the completeness with which this section today is using its own natural economic advantage to further increase its strategic position by not only participating in, but actually controlling, every phase of the production of cotton textiles, from the preparation and cultivation of the soil for the planting of cotton seed, to the delivery of its own goods to its own consumers, using its own highly developed transportation and marketing facilities, as well as its own financial structure.

This increasing sectional wealth has led also to a growing degree of education and appreciation of the better things of life. Thus we find the demand and use for finer goods of all kinds constantly enlarged and the consumption of goods per individual not only rapidly rising, but being outstripped in pace by the value of goods used individually. Hence, we find the South in the very healthy condition of being able to absorb, itself, much of its own high grade products—a condition most favorable to the continuance and permanence of the variety of production now under way in this territory.

Not only does this tendency apply to cotton goods, but it applies to the production of wool fabrics, cotton, wool and silk mixtures, and even to the production and use of artificial silks and asbestos fiber, and to every variety of knitted product, including hosiery, underwear, jerseys, and outer garments.

The knitting industry particularly is making remarkable strides in development, notably in Eastern Tennessee and North Carolina where mills are using cotton yarn, carded and mercerized; artificial silk; pure silk, and wool fiber in the manufacture of all sizes and sexes of hosiery.

The use of these fibers is accomplished both separately and in combinations to produce attractive effects. Artificial plaited on mercerized cotton, and pure thread-silk, plaited on or twisted with artificial silk, compose numbers made in many of the mills—made and sold successfully.

A large number of the mills are making sheer silk, seamless hosiery for ladies, of a quality not surpassed by manufacturers of this line in any other section of the country. That their lines take, in the market, is evidenced by the continued operation, day and night shifts, of one mill in Tennessee, on ladies' silk work—organized several years ago by southern men and operated by southern brains.

The hosiery market to a large degree is controlled by

the passing popularity of novelty designs and fads of the moment. At one mill in a small Tennessee town a visitor found the manager installing an attachment for producing a new check plaited design, at the moment very popular in the market. On his return to Atlanta he noticed a retail store featuring this style as the latest development in half-hose design; and inquiry proved it to be an attractive seller. This one incident might be used to show that the southern mill is right up in keeping abreast of the turns of the market, and in turning out up-to-date products.

The old assertion that the South does not possess the skilled help to produce the finer numbers, is proved a fallacy by an examination of the products turned out by the knitting mills of this section. Southern-made goods will be found in all the markets right along with products from the other sections in practically every line and style offered.

The one exception to this is full-fashioned hosiery, which has had a belated start in the South. There are now several mills on this class of work, and others not only in contemplation, but actually organizing. In this particular line, though it will require considerable training to equip the inexperienced southern help for its manufacture, the South eventually will have the decided advantage of a much cheaper labor cost, thus being able to compete with the mills in the Reading section, where a large part of this country's production of full-fashioned hosiery is made, and where organizations of full-fashioned operators have elevated wage scales to such excessively high levels as in themselves to almost preclude the manufacture of the line at a profit.

Knitted underwear is confined to a smaller range of styles and patterns, but in this field, also, the South has made itself an important market factor, the quality of its products in cotton and wool numbers being generally recognized.

These changes in the gradual production of the finer grades of product have been going on for several generations, but not to the very marked degree as now exists. Certain farseeing manufacturers have long realized the latent adaptability of southern labor to the finer grades of goods, and have produced denims, toweling, gingham, sheetings, men's underwear, etc. But the great change in the production of the finer grades of yarns and fabrics, and of their complete finishing in the South, has been largely a matter of post-war development. A recent inspection of a half dozen mills showed that in the last six months they have changed over as follows: one from coarse yarn, to tire fabrics; one from coarse yarn to 25 harness ladies' dress goods; one to silk preparatory machinery; one, from print cloths, to combed yarns and dobby looms; one, from coarse sheetings and osnaburgs, to dye plant and dobby looms; and one from jacquard damasks, to art-silk draperies.

The last mentioned change touches a phase of development that is becoming peculiarly progressive. Artificial silk is being consumed, in the whole fabric to some extent, but to a very great extent as a mixture with other yarns. As illustrating the increasing consumption of artificial silk in the South, a recent compilation of statistics from a number of shippers showed that the number of southern purchasers in 1923 as compared to 1922, had increased 123 per cent; and on top of this the 1924 increase as compared to the 1923 total, showed an exact doubling. In this connection, the dollars and cents business for the year 1924 showed in November a gain of 120 per cent over the first part of the year.

Artificial silk has come to stay. The wide diversity of application, and the deftness with which it can be combined into intriguing patterns with other yarns, has caught the popular imagination, and the demand seems to be well ahead of the supply. It is peculiarly inspiring to know that this section of the country is not only awake to the possibilities in this respect, but is actually engaged in taking immediate advantage of them.

Not only the production of the finer yarns and fabrics but in their finishing the South is also rapidly illustrating its adaptability, versatility and the timeliness of its appreciation of its own possibilities. Bleaching, dyeing and even print works are being installed at a rate that is amazing. The Pacific Mills have just completed and put into operation near Spartanburg, a tremendous initial dye and print works that is planned in a few years to equal their enormous plant at Lawrence, which is the largest in the country. The United States Finishing Company at Cedartown, Georgia, has completed its finishing plant, and, like the Lowell Bleachery at Griffin, Georgia, is already operating. The American Thread Company at Dalton, Georgia, has now under construction the first unit of what will be a tremendous plant that will manufacture, for the first time, spooled threads in the South.

As illustrative of extreme variety, the General Asbestos Company, at Charleston, has for some years been spinning and weaving asbestos fiber in the production of asbestos fabrics, particularly brake linings. Mercerizing, starting in 1911 in a small way in one plant, now is represented by a number of commercial plants of good size as well as private mercerizing departments in connection with some mills.

In a recent issue of the *Daily News Record* appeared a list of southern mills which changed the character of their products during the last six months of 1924. As illustrative of the trend in the direction of diversification, the following examples, taken from this list, are presented:

The Star Mills, Athens, Ga., which formerly produced 24s yarns, are now making yarns, fancy dress goods and draperies.

The Sibley Mfg. Co., Augusta, Ga., manufacturing drills, tickings and denims, now are also making scrim.

The Cochran Cotton Mills Co., Cochran, Ga., which formerly made convertibles, have changed their output to bedspreads and dobbys.

The Massachusetts Cotton Mills, Lindale, Ga., have added cheviots to their lines of denims, drills and cantons.

The Georgia Duck and Cordage Mills, Scottdale, Ga., have added a line of laundry nets in addition to duck.

The Louisville Textile Co., Louisville, Ky., formerly making marquisette window curtains, are now making dobby and leno specialties.

The Hobarton Mfg. Co., Concord, N. C., has changed its production from ginghams to novelty dress goods.

The Minette Mills, Grover, N. C., are now making bedspreads in addition to damask and napkins.

The Orion Knitting Mills, Kinston, N. C., formerly making cotton hose and sweaters, have changed to high-grade combed mercerized and fiber silk hosiery and sports coats and swimming suits.

The Stonecutter Mills, Spindale, N. C., in addition to making fancy ginghams, are also producing fancy dobby dress goods.

The Aiken Mills, Bath, S. C., have discontinued making print cloths and sheetings in favor of shirtings, drills and dobby goods.

The Derry Damask Mills, Gaffney, S. C., formerly making only damask, are now producing cotton and silk dimity.

The F. W. Poe Mfg. Co., Greenville, S. C., in addition to convertibles, pajama checks and colored and artificial silk stripes, are also making tobacco cloths.

The Shamrock Damask Mills, Landrum, S. C., are now making silk and cotton dimity as well as cotton damask.

The degree of participation of the South in finishing, and in the production of the finer textile products may be more readily realized perhaps when it is known that not only such fabrics as gingham, towels, sheetings, drills and damasks are being produced, but that silks, plush, draperies, tapestries, velvets, carpets, asbestos and cotton brake linings, tire fabrics, cord fabrics, woolens, men's suitings, overcoats, upholstery, and in fact practically every fabric that is known to the industry is now being produced in the South to the extent of at least one mill's production.

The economic effects of this territorial diversification are far reaching. Primarily, these goods are being produced in the South because they can be manufactured and distributed to the ultimate consumer more cheaply originating in the South, than they can in the North. The result on price alone with the present differential existing in the South cannot help but for a long time to intensify this trend. This means that many plants previously located in the East, must either move, or establish branch plants in the South on every line of these finer goods that can be produced in the North; and there are some classes of foreign goods now produced abroad which the North will find it profitable to produce, and can with proper energy and selling tactics educate this country to use, to the exclusion of the imported article.

As regards foreign goods, there seems to be either an inherent liking on the part of the public for imported articles, or there is a native prejudice against domestic products of the same type as compared with the imported article, that will support the imported market always. This is true, to some degree, of the southern market as applied to southern produced goods when competing with established goods of New England. In these instances the same goods, quality for quality, have brought a sufficient premium when imported, even including the necessary tariff, as to make the same goods in this country impossible to market competitively. Some instances have been met when southern jobbers have refused cheaper goods of a given quality produced in the South, as against old established grades produced in the North. This psychological trait which seems to impart to goods produced at a distance a glamor not found in the home product, can gradually be worn down, but the process will be slow and the established products in these lines, both foreign and the well-advertised New England products, will enjoy a domination of their markets for some time to come.

By these old established—ex-officio, as it were—advantages, New England and the North is not going to suffer any immediate upheaval in the loss of its plants. Particularly is this so when it comes to distribution. Certain markets are out of the reach of southern competition because of the limitations imposed by shipping rates. And in certain well preserved, efficiently managed old mills, the low cost of their long time ago investment makes for a low overhead differential that cannot be met by the newer, more costly southern mills.

Roughly, however, there is no question but that the textile industry is on the march as regards location. Its van for many years centralized in the Carolinas on the coarser yarns and fabrics. This front is now gradually proceeding through the cotton belt south and westward. Georgia, Eastern Alabama and Eastern Tennessee are already becoming well populated with textile mills, many of which are finishing goods. Already we hear echoes of mills under construction, and some in operation through Arkansas and into Texas. These outposts, naturally, are on the coarser yarns and fabrics. It will always be true that the center of the finer and finished goods production will be well within the outer edges of the industry, because they, themselves, are the users of the yarns and unfinished goods produced by other plants. It is to their interest for finishing plants to be so located as to draw economically to their plants the required raw materials which in this case are the finished products of other mills.

Regardless, therefore, of likes or dislikes; of the psychology of style, or the barriers of tariff protection, the South is now occupied, and will to an increasing degree engage in a complete utilization in its own back yard of its own raw materials. Primarily, this is because certain unexploited advantages in labor, nearness to raw material, cheapness of power, facilities of transportation to consuming markets, and temperate and favorable climate permits cheaper production. And secondly, to the awakening appreciation on the part of the natives of the South to the realization that a single line of endeavor, such as agriculture, is not only unprofitable, but dangerous, and that in the diversification of energy lies a stabilization of occupation and income that is the fundamental basis of continued prosperity.

"DICTIONARY OF TEXTILES," by Louis Harmuth. Third Edition. 222 pages. Publishers, Fairchild Publishing Co., 8 East 13th Street, New York City. Price, $10.00 per copy.

This well known reference book was first published in 1915, and the third edition, recently issued, is now offered. This edition contains nearly 8,600 terms, which is an increase of over 30 per cent over the original work. All textiles, from fibers to finished products, are listed, defined and arranged in alphabetical order, with each definition or description condensed into the smallest compass consistent with clearness.

Also included among the terms listed and defined are the names of the more important chemicals used in manufacturing and finishing textiles and the particular uses of these chemicals are stated. Copies may be secured direct from the publishers, or through COTTON'S Book Department.

Link-Belt Company, Indianapolis, has developed a new malleable iron safety collar for maintaining the proper alignment of pulleys, shaft bearings, hangers, etc. A new design permits the collar to be split in two pieces for ready and economical installation. This type of collar, however, is made also in the solid ring type, both types being machine finished to assure a tight fit and a pleasing appearance, it is stated.

"If Winter Comes"

Being a Recognition of the Possibility of a Summerless 1926 and a Discussion of How Such an Emergency Would Effect the Textile Industry

BY WILLIAM SIBLEY.

Like stage coaches, pony expresses, Solar lamps, and Virginia Dare, the old time "weather man" is no more. The "prognostications" and "fore-casts," much of which had slight foundation in fact, have given way to definite and accurate predeterminations made by scientists and experts. Few modern sciences have developed more rapidly or deserve more respect than that of weather forecasting. The "Bureau" is using instruments today unheard of 25 years ago. The knowledge with which they now pursue their tasks has been increased 100 fold since old "Chin Whiskers" cast his "weather-eye" upward and reckoned it would rain tomorrow. Unheralded and unsung, the Weather Bureau is saving agriculture and industry countless millions annually. And though they may have disproven themselves in times past, it will harm nothing to consider, at least in principle, the conclusions of our scientists.

Our summer just past was universally cold, backward, erratic. Next summer (1925) will probably be much colder. 1926 may have no summer at all. At least weather experts and scientists of the Smithsonian Institution are inclined to that belief.

Having no summer—no growing period—but merely a continuation for twelve months of freezingly cold weather is a very somber outlook. In such an instance, the realization would probably exceed anticipation.

To many, the thought of a summerless year is absurd, unthinkable. Never having had such an experience it is difficult to imagine the extent of such a catastrophe. But there have been summerless years, and what has been can be again.

It is a matter of history that the year 1816 was one of extreme severity. During that year practically no crops were raised north of what was later known as the Mason and Dixon Line, and only a partial crop in the southern states. A half inch of ice formed in New York City on July 4th, 1816. That year was known as the "year without a summer" over a large part of the world, for Europe, it seems, was similarly affected.

Blodgett, in his "Climatology of the United States," states that all the summers from 1811 to 1817 were cold in this country and that in every summer month of both 1812 and 1816 snows and frosts occurred throughout the northern states. 1817 was known as "poverty year" or "eighteen hundred and froze to death." In New Hampshire it was popularly called "mackeral year" because people were forced to eat mackeral instead of pork, practically none of which was fattened owing to the scarcity of corn.

Further assurance that 1816 was "a year without a summer" appears in Charles Pierce's "Weather in Philadelphia." Speaking of that locality Pierce says: "—there was ice during every month of the year, not excepting June, July and August. There was scarcely a vegetable came to perfection north and east of the Potomac." Also, in the "Monthly Weather Review" which cites the recollections of James Winchester, of Vermont, there appears: "It is said that in June of that year (1816) snow fell to a depth of three inches in New York, Pennsylvania and New Jersey on the 17th; and five inches in all the New England states, except three inches in Vermont. The storm of June 17th was as severe as any that ever occurred in the depth of winter. It began about noon, increasing in fury until night, by which time the roads were impassable by reason of the heavy snow drifts. Many were bewildered in the blinding storm and were frozen to death. . . . . There was a heavy snowstorm August 30th. . . . . The year 1816 had neither spring, summer nor autumn. The only crop of corn raised in that part of Vermont that summer was saved by keeping bonfires burning around the cornfield night and day."*

History has been known to repeat itself. And when present day weather experts and scientists at the Smithsonian Institution incline to the belief that during 1925, 1926 and 1927 it may do so, we of the uninformed and unstudied do not flatter our intelligence by hastily pronouncing their inclination as absurd or their conclusions as baseless.

Through recent developments in the science of weather forecasting it is now possible to predetermine the general trend of weather two and three years in advance. Since 1905, weather experts have found that the penetration of the sun's heat does not affect our climate conditions immediately. Rather, that the sun's heat intensity is delayed in its earthly effect from one to three years. Since that time, also, they have been studying the "solar constant" continually; they discovered that the normal average is approximately "1.94 gram calories of heat per square centimeter of earth's atmosphere per minute." That is the way they measure "solar constant" and, according to their records, 1.94 is the normal average.

Sun's Heat Below Normal.

Since 1922 these solar radition values have decreased markedly. From May, 1922, to June, 1923, the "solar constant" was continually below 1.92 and since February, 1922, the constant has not reached the normal 1.94. At the present time the trend is encouraging but still far from normal.

The material lowering in the sun's heat penetration during 1922 is given by Mr. Browne, of the Institute, as the reason for our chill, backward and erratic summer (1924). The low tendency of the "constant" throughout 1923 and thus far into 1924 is given as the reason for the prediction that next summer and the one following will be increasingly cold, with a possibility of a return to the 1816 conditions —"a year without a summer."

Proof of the value of such research is to be had in the present ocean temperatures. Scores of vessels have reported, during the past six months, that oceanic temperatures are approximately twelve degrees below normal. This condition extends to practically all waters. Extreme snows and severe weather was reported throughout Scandanavia, Northern Europe, Scotland, Australia, and New Zealand

* Credit and thanks for this information must be extended to C. F. Talman's Meteorology.

during 1923-4, and unprecedented floods have been experienced in certain parts of South America and Africa during the past 12 months. During July of this year light frosts were experienced in Illinois. These conditions are effects of the solar constant decline, according to the experts.

Considering that the weather-man joke passed into oblivion along with the mother-in-law and horseless-carriage wheezes, it is our belief that serious thought should be given the available facts. With the highly developed instruments now employed and with the cumulative knowledge and experience on the part of the weather experts, such conclusions, however somber, should be accorded an open mind. For it will be seen, upon thought, that a completely cold summer is not necessary to blight our crops and throw the northern half of the United States into wide spread disaster. A killing frost in June, followed by one in July, would be sufficient to spell destruction to all agricultural products, including hay, and upon which products we are dependent, at least for food.

Prof. Cox, Senior Meteorologist of the U. S. Weather Bureau, shows no alarm at Mr. Browne's prediction, and therein lies a ray of hope and cheer. However, Professor Cox hesitates, even refuses, to heavily discount Mr. Browne's statement. He points out that Mr. Browne changed instruments and location of research during his "solar constant" measurements and that such a change might have affected the "apparent" decline which ranged from one to 2½ degrees.

However, it has been quietly reported that several large and influential members of the electricity and gas producing industries are already laying plans for such a three-year emergency. Action of this kind gives us incentive to think of our own industry, our own business.

Effect Upon the Textile Industry.

How would continued cold weather affect the textile industry? Knowing that cotton is raised in states least likely to be affected by cold weather, it is obvious that the source of raw material would not be affected. That would assure, therefore (in contrast to the flour milling industry, for instance), no interruption in manufacturing activity. Indeed, such an emergency would impose a tremendous demand for textile goods, it being seen that more than half the nation's population would have need for cold weather apparel continuously. Hence, assuming history *did* repeat itself in this regard, the problem confronting the textile industry would be one of production rather than adjustment.

Such a problem, we have demonstrated, can be successfully met. We will not soon forget our War lessons in production, nor will the nation, we believe, cease to be thankful that the boys who served were warmly and serviceably clad. However, a winter emergency would be unlike, in many respects, a War emergency. For one thing, the War imposed a demand for the sudden supply of five or six million men. A winter emergency would increase that demand ten fold for there would not be six million to clothe, but rather sixty million. Furthermore, essentials that were assured us during the War would have no definite assurance in this instance. Coal, as an example, would probably not be so generously parcelled out in 1927 as it was in 1917. The coal supply would, therefore, be of extreme importance.

In this connection it is interesting to know that a very simple method for storing coal without danger of spontaneous combustion has been discovered. The Delaware County Electric Company at Chester, Pa., has stored bituminous run-of-mine in piles upwards of thirty feet high and allowed the coal to remain in storage for long periods of time without the slightest indication of combustion.

A locomotive crane, equipped with a 1½-yard grab bucket, stores the coal out in piles reaching upwards of 30 feet. In order to prevent internal heat or spontaneous combustion the coal is delivered rather evenly over the piles in successive layers of three or four feet. Each layer is packed down with a heavy roller drawn by a crawler tread tractor. The roller seals each layer by its crushing or packing action, which prevents the entrance or circulation of oxygen. Coal has been allowed to remain in storage in this manner, in quantities ranging upwards to 125,000 tons, for two years—then found, upon reclamation, to be entirely free from internal heat.

There appears also the necessity for setting the plant in order, of making thorough preparation for hard service to machinery and (where located in New England) adequate measures for the conservation of heat and power.

Too many textile manufacturers fail to recognize the large economies in fuel that may be effected through properly designed and maintained heating equipment. It is unfortunate that manufacturers in general pay so little attention to the loss of heat due to infiltration. Cold air leaking into a building on the windy side and warm air leaking out on the opposite side constitutes infiltration loss. Too often this loss is great. Very often it could be reduced by a little attention to building construction, the rearrangement of mains and radiation and the proper distribution of heat. Inexpensive attention paid to these items would result in the saving of large quantities of coal. The cold air coming into the average plant amounts to from one to three times the cubic contents of the room each hour, the amount depending largely upon the velocity of the wind. All infiltrated air must be heated and a windy day imposes a great additional load on the boilers.

Many mills are improperly heated. Too much heat in some rooms, with a lack of heat in others, is a condition commonly found. Not only does this affect the consumption of coal but it materially affects the efficiency of the workers, the latter item being perhaps the more expensive. Taking into consideration the building construction, infiltration, exposure, insulation of mains, and other elements, heat losses can be calculated and steps taken toward correction.

More and more metal sash is being employed in textile mill construction. This sash, being of a durable nature, is often abused by slamming. This results in injury to the sash which injury must be straightened before the sash can be made to close tightly. Such sash can be caulked with a plastic cement (around the edges) if the sash is not air tight.

Some Tips on Heating and Power Economy.

Heating engineers tell us that at least 2½ inches of space between the wall and the radiator are necessary to assure good results. In mills employing overhead belts as power transmission, the transmission of heat is increased slightly due to the air currents intensifying the velocity of air passing over the radiators. Automatic temperature controls very often effect a saving in heating fuel of from 40 to 60 per cent. When a boiler is shut down, let it cool off slowly. Cooling a boiler too rapidly will cause fire

brick trouble. The brick setting in a boiler should be absolutely tight and free from leaks if a high degree of boiler efficiency is to be maintained. A troweled layer of plastic cement on the outside of the boiler will do much to fill cracks and stop leaks. Make one man responsible for heating efficiency. Dividing this responsibility results in buck-passing and wasted coal. Predetermined mill temperatures are not always correct. Humidity is a key factor in workmen efficiency. Seventy degrees will be too cool for comfort when the humidity is low. With a high humidity 68 degrees will probably be too warm. Common sense must enter into the distribution of heat. Leaking radiator valves are costly in coal. Pipe coils should be lined to avoid sagging and water pockets. Steam traps are supposed to remove condensation without wasting steam. Poorly operating traps waste a great deal of fuel. Some of the larger companies such as Swifts, Ford Motor Company assembly plants, etc., have provided their boilers with dual feed systems. Though they may use coal as fuel principally, they also have oil burners and an oil burning system ready for operation. This foresight frees them from dependence upon one kind of fuel for heat and power.

Silent chain as power transmission has been known to increase production of twisters, spinning frames, and some other textile machinery up to ten per cent. Steel shelving for storage not only reduces fire hazard and insurance rates but increases storage capacity up to 15 per cent over wooden shelving. Power trucks and trailers in plant transportation range from 50 to 800 per cent more efficient than hand operated trucks. Ventilating systems remove all dust, lint and bacteria and their maintenance is very low. White interior paint saves its cost in lighting expense and adds to the efficiency of employees. It can be applied with a paint spray gun with one-fourth less paint and in one-tenth the time and expense that would be required with ordinary painters and four-inch brushes. A fan in the generating room draws off all surplus heat and allows the generators to operate with increased efficiency.

All of which is given only to cite a few of the numberless ways by which a mill can be brought to a high standard of efficiency and a higher level of production. Such thoughts are but natural in seriously considering the production increases and the operation economies that would be necessary—"If Winter Comes."

Consideration of this emergency will reveal, also, the necessity for quiet action. Preaching alarm or causing panicky or hasty conclusions on the part of the uninformed will do much harm. Calm, sane, unostentatious preparations will be far more helpful than hasty or sensational action. The latter will not put the industry where it can best protect itself or serve the greatest number.

A summerless year would be more disasterous, perhaps, to some other industries than to ours. We are practically safe in our source of raw material supply. We have, for the most part, the advantage of geography. And, indeed, there may come no such year. We hope not. We hope Professor Cox, not Mr. Browne, is right. However, meteorologists are like physicians—there is no telling which one is correct. Remembering this and the advances made in the science of weather forecasting, it will harm nothing to accept, at least in principle, the conclusions of those who have made a life-study of the subject. Certainly, it can do no harm to lift the level of efficiency of our mills in any case.

THE HERITAGE OF COTTON, by M. D. C. Crawford. 244 pages, 21 plate illustrations. G. P. Putnam's Sons, New York and London, publishers. Price, $7.50.

A long unfilled place in literature relating to cotton has been filled by this recently published volume by one of the industry's best informed authorities. In his extended experience as research editor of "Women's Wear," as associate editor of "Daily News Record," and as research associate in textiles for the American Museum of Natural History, Mr. Crawford has admirably equipped himself for the preparation of this work.

The book is called "The Heritage of Cotton, the Fiber of Two Worlds and Many Ages," and it is from a human standpoint that Mr. Crawford has dealt with the subject, in presenting a "record of a great fiber that has played a large part in the civilization of two hemispheres and across more ages than modern civilization may safely span." Delving into "the distinguished accomplishment of cotton's golden yesterdays," prior to the last century and a half of mechanical effort with which the textile man has been more intimately concerned, Mr. Crawford has shown the history of the cotton fiber from the primitive ages in a most informing and interesting manner that befits his reputation in this work.

A brief review scarcely can do justice to "The Heritage of Cotton." Mr. Crawford tells of the primitive culture and primitive technique used in connection with cotton, of the story of cotton in the new world, of its history in Peru, India, Europe and England. Bringing the story down to more modern times, he discusses mill building in New England, the southern textile industry, the importance of research, and other pertinent subjects.

The volume is illuminated with plate illustrations showing ancient types of decorative fabrics made from cotton, and other things of historic value and interest, many of which have been personally collected by Mr. Crawford in his numerous researches and investigations.

Mr. Crawford has produced a human record of cotton that is an eminently readable book, filled with interest and amazing information.

J. E. Sirrine & Company of Greenville, S. C., announce the opening of offices in Chattanooga, Tenn., with Fred L. Bryant in charge. Through this office, in the Tennessee Electric Power Building, J. E. Sirrine & Company plan to serve northern Georgia, Alabama, Tennessee and Mississippi with the same service as rendered the Carolinas and Virginia by their Greenville office.

The New York & New Jersey Lubricant Company, originators and sole manufacturers of "Non-Fluid Oil" for textile lubricants, have recently moved into their new offices at 292 Madison Avenue, NewYork City. The growth of the company's business has made this move necessary and in their new quarters they will have ample facilities for taking proper care of their increasing trade. The works of the company are located at Newark, N. J., and for the convenience of customers warehouses are maintained at the following points: Charlotte, N. C.; Greenville, S. C.; Atlanta, Ga.; New Orleans, La.; Philadelphia, Pa.; Providence, R. I.; Chicago, Ill.; St. Louis, Mo., and Kansas City, Mo.

Cost of "Long" or "Short" Cotton

BY E. G. FIELD
OF THE COST ACCOUNTING STAFF OF MARWICK, MITCHELL & COMPANY

What does your cotton cost?

There are various ways to determine the cost of warehouse cotton according to the accuracy desired. In practice an average cost is generally used, but the methods of averaging differ. While some concerns are content to average the purchases of the year with the opening inventory, the progressive average is determined by regularly taking out the value of the cotton used as based upon the average cost at that time and then continuing the steps each period.

For example:

Opening Inventory	1,000,000 lbs.	@	27.00c	= $270,000
Purchases this period	400,000 lbs.	@	28.00c	= $112,000
Total	1,400,000 lbs.	avg.	27.29c	= $382,000
Used this period	500,000 lbs.	"	27.29c	= $136,450
New Inventory	900,000 lbs.	"	27.28c	= $245,550

But you are dealing in cotton other than that in your mill to the extent of your hedges. Then on what basis should you consider cotton cost in figuring the attractiveness of cloth sales?

It is impossible to directly lay down a complete plan for every company as their hedging operations are usually handled from specific viewpoints. A typical general plan might apply to a company that hedges all cotton for protection against market movement and avoids speculation in their raw material.

Such a policy might view all cotton, including warehouse stocks, in-process cotton, and the cotton content of finished goods as necessary to protect. It is important to note here that due allowance must be made for loss through waste when determining the equivalent value of the raw cotton content of process and manufactured goods. Purchase commitments can seldom be included as they are not commonly entered at definite prices.

The hedging contracts can be inventoried to determine the total quantity and value. This inventory as applied against the total cotton inventory, defined in the previous paragraph, will then give the inventory available for sales orders.

The unfilled sales orders can be inventoried for equivalent cotton content and priced at the average price for the net cotton available and when applied against the cotton available will give the position, long or short, with its value which can be readily converted into the cost of that position.

Such a plan can be carried forward from day to day in fairly simple and practical manner by summarizing the daily transactions of net cotton purchases, net cotton hedges sold, and net cloth sales, so as to develop a statement of position and cost which can be operated upon the principle of progressive averages. A hypothetical illustration is produced in tabular form on the next page.

This tabulation summarizes the daily operations to determine the cost of the long or short cotton at the close of each day's transactions and is further arranged to daily prove the additions and subtractions. Transactions opposite the headings, such as cotton sales, are entered in red figures (here illustrated by *) to the same column, and are subtracted or added, as the case may be.

The columns are arranged for this order:

To Opening Position .....*A*
add Cotton Purchases .....+*B*
while subtracting Cotton Hedge Sales —*C*
for Cotton Available .....=*D*
then subtract Cotton in Cloth Sales —*E*
and obtain Closing Position .....=*F*

To follow a few steps in the tabulation, the Inventories were entered. The Cotton Purchase inventory, including all cotton, was valued at an accepted inventory price. The Cotton Hedge Sales, not closed, were inventoried at their actual sales prices and subtracted from the full cotton inventory, shown as Cotton Purchases, to determine the inventory of Cotton Available for Cloth Sales. The inventory of unfilled sales orders in pounds, increased for waste allowance, was determined and priced at the average cost per pound of Cotton Available to furnish the inventory value of Cotton in Cloth Sales. This last inventory was then subtracted from the Cotton Available to determine the final position and value as at the close of that day, which in this instance was 50,000 pounds long at 25.57 c on 2/28.

The transactions of the next three days were made singly for illustration purposes. Daily starting with the previous closing position, these entries of 3/1, 3/2, and 3/3 show the effect of additional Cotton Purchases, Cotton Hedge Sales, and Cotton In Cloth Sales, on the position and the progressive average cost of the Long Cotton.

On 3/5 both Hedges and Cloth were sold to cover all cotton available. This step reduced the unit cost of cotton in cloth sales to the extent of the last price on cotton available. It is important here to note the further effect of relative quantities involved in transactions which are not offsetting.

Under date of 3/10 a true theoretical transaction is given as the purchase of outstanding Cotton Hedge Sales (posted in red but here indicated by *) to offset the sale of Cotton In Cloth, executed on the same day and at a time when the position was even so that the price involved in the hedge operation would be that applying directly to the cotton in the cloth sales.

March 11 adds another offsetting transaction. The purchase of cotton and the sale of hedges, here being executed at different prices, result in a possible or potential profit with no change of position. This produces a red figure (here indicated by *) in the Close Long, the color signalizing the event.

On March 20, starting with an even position and potential profit of $100, a net loss of $300 was encountered in the hedges, representing an offsetting operation such as might occur in the purchase of one month's sales and the resale in another month. The result of this transfer shows the position even, with now a potential loss of $200.

The next transactions on 3/21 involve varying quantities. The Hedges Purchase (entered in red as opposite the column heading and here indicated by *) was executed on a falling market, the value of this purchase must be added

POSITION AND COST OF LONG OR SHORT COTTON

	OPEN LONG			COTTON PURCHASES			COTTON HEDGE SALES			COTTON AVAILABLE			COTTON IN CLOTH SALES			CLOSE LONG		
DATE	LBS.	PRICE PER LB.	VALUE	LBS.	PRICE PER LB.	VALUE	LBS.	PRICE PER LB.	VALUE	LBS.	PRICE PER LB.	VALUE	LBS.	PRICE PER LB.	VALUE	LBS.	PRICE PER LB.	VALUE
2/28	Inventory			1 000 000	2625	2 625 000 00	650 000	2700	1 755 000 00	350 000	2557	8 949 500 00	300 000	2557	7 671 000	50 000	2557	1 278 500 00
3/1	50 000	2557	1 278 500 00	10 000	2700	270 000 00	—	—	—	60 000	2582	1 549 200 00	—	—	—	60 000	2582	1 549 200 00
3/2	60 000	2582	1 549 200 00	1 010 000		2 677 000 00	650 000		1 755 000 00	360 000		9 220 000 00	300 000		7 671 000 00	60 000		1 549 200 00
				—	—	—	10 000	2650	265 000 00	50 000	2568	1 284 000 00	—	—	—	50 000	2568	1 284 000 00
3/3	50 000	2568	1 284 000 00	1 010 000		2 677 000 00	660 000		1 781 500 00	350 000		8 995 500 00	300 000		7 671 000 00	50 000		1 284 000 00
				—	—	—	—	—	—	50 000	2568	1 284 000 00	10 000	2568	256 800 00	40 000	2568	1 027 200 00
3/5	40 000	2568	1 027 200 00	1 010 000		2 677 000 00	660 000		1 781 500 00	350 000		8 955 500 00	310 000		7 927 800 00	40 000		1 027 200 00
				—	—	—	30 000	2650	79 500 00	10 000	2322	232 200 00	10 000	2322	232 200 00	—	—	—
3/10	—	—	—	1 010 000		2 677 000 00	690 000		1 861 000 00	320 000		8 161 000 00	320 000		8 161 000 00	—	—	—
	—	—	—	—	—	—	* 10 000	2750	* 275 000	10 000	2750	275 000	10 000	2750	275 000	—	—	—
3/11	—	—	—	1 010 000		2 677 000 00	680 000		1 833 500 00	330 000		8 436 500 00	330 000		8 436 500 00	—	—	—
	—	—	—	20 000	2700	54 000 00	20 000	2750	55 000 00	—	—	—	—	—	—	* 100 000		* 100 000 00
3/20	—	—	—	1 030 000		2 731 000 00	700 000		1 888 500 00	330 000		8 436 500 00	330 000		8 436 500 00	—	—	—
	—	—	* 100 00	—	—	—	* 10 000	3000	* 300 000	—	—	—	—	—	—	* 100 000		* 100 000 00
				1 030 000		2 731 000 00	700 000		1 888 500 00	330 000		8 436 500 00	330 000		8 436 500 00	—	—	—
3/21	—	—	—	—	—	—	* 20 000	2600	* 520 000	20 000	2700	540 000 00	10 000	2700	270 000 00	10 000	2700	270 000 00
	200 00																	
3/24	10 000	2700	270 000 00	1 030 000		2 731 000 00	680 000		1 833 500 00	350 000		8 976 500 00	340 000		8 706 000 00	10 000		270 000 00
				—	—	—	* 10 000	2550	* 255 000	20 000	2625	525 000 00	10 000	2625	262 500 00	10 000	2625	262 500 00
				1 030 000		2 731 000 00	670 000		1 808 000 00	360 000		9 230 000 00	350 000		8 968 500 00	10 000		262 500 00
3/25	10 000	2625	262 500 00															

to the potential loss carried over and makes the Available price higher for use on that day's sales of Cotton In Cloth.

The following active day opening with a long position at 27.00 cents contains offsetting transactions with purchases at 25.50 which leaves the same closing position at 26.25 on 3/24.

The entries discussed are intended as only indicative of some of the possible combinations of events which can be carried though on the same general plan. In practice some surprising changes may be observed when varying quantities are jointly involved.

In many mills the same idea may be applied weekly rather than daily and may be arranged to record vertically rather than horizontally. In one instance the record has been made somewhat historically to include the names of the companies with whom the transactions were executed and serves as a proof of the cotton purchase accounting as well as exercising a control over the cotton records.

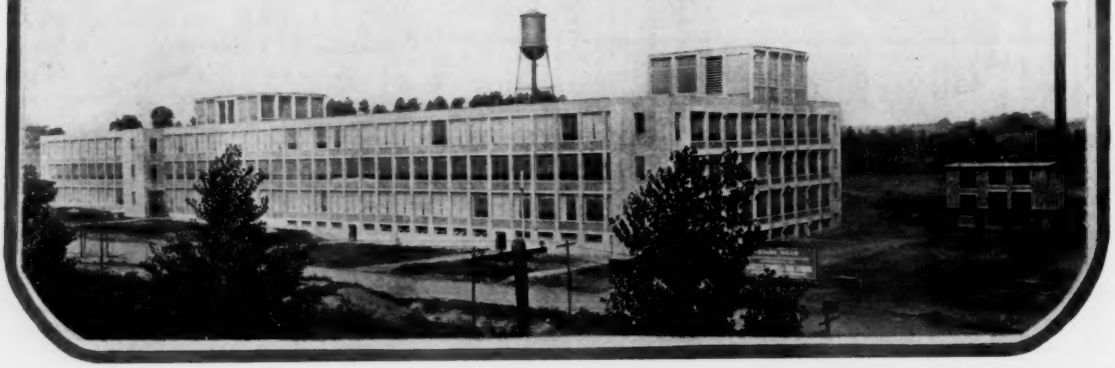
This plan is not a "cure-all," for in itself it is liable to certain errors which, when understood, may be held to a minimum of slight effect that can be regularly ascertained and cleared by frequent inventories.

It is advisable that no attempt be made to include such position costs in the formal general or cost accounting, but rather that such information be collected as a separate issue for a direct guide to the management between the intervals of monthly financial reports.

The position costs serve the joint purposes for recording the long and short position, for observing their parallelity to the trend of market prices as proof of the hedging insurance, and for use as the cotton price base to include in the mill costs when considering the desirability of prospective cloth sales.

Announcement has been made that the number of exhibits at the Twenty-First Annual Knitting Arts Exhibition, to be held April 6th to 10th, at Commercial Museum, Philadelphia, will exceed that at any previous Exhibition. This is the annual Knitgoods Show conducted under the auspices of the National Association of Hosiery and Underwear Manufacturers, and in conjunction with their annual convention. Chester I. Campbell, 329 Park Square, Boston, who has operated the Knitgoods Show for the past several years, will be in personal charge of this year's exhibit. It is understood that this show will be like the one held last year in all of its principal events. The events themselves will be on a broader scale than ever before it is stated.

THE NEW STARK MILLS at Hogansville, Ga.



Back in 1805 Manchester, N. H., held as its chief claim to distinction the fact that it was a good fishing resort. About that year the origin of what is now the Amoskeag Manufacturing Company came about, and early in 1838, certain men, most of whom were interested in the Amoskeag Manufacturing Company, decided to form a separate company for the manufacture of cotton goods.

This new organization was incorporated under the name of the Stark Mills, so named in honor of General John Stark, the Revolutionary War hero of New Hampshire. The mill was completed early in 1839 and equipped with 8,192 spindles and 240 looms. On June 24th, power was applied to the mill, and the cards were ground, and on July 21st, "they got off two pieces of cloth, having been less than one month from the commencement of grinding cards to the production of cloth."

The second mill was built in 1839 and was also equipped with 8,192 spindles and 240 looms. In 1844 a third mill was built, joining the two original structures, and bringing the equipment up to 21,400 spindles and 622 looms. The Stark Mills continued to develop and expand, and in June, 1922, when the mills were acquired by and combined with the Amoskeag Manufacturing Company, the equipment was listed at 88,000 spindles, and 2,300 looms, manufacturing sheetings, shirtings, drills, and other goods.

This story, however, is not intended to be a history of Manchester, nor of the New Hampshire Stark Mills, but its purpose rather is to deal with and describe the latest property constructed under the historic name of Stark Mills, an example of mill construction. The historical facts which begin the story are presented merely as furnishing the background for the present plant, which through conditions which have developed during the years, was established at a point distant from the location of its antecedents. The plant in question is the new Stark Mills Division of the New England Southern Mills, at Hogansville, Georgia, some 58 miles south of Atlanta.

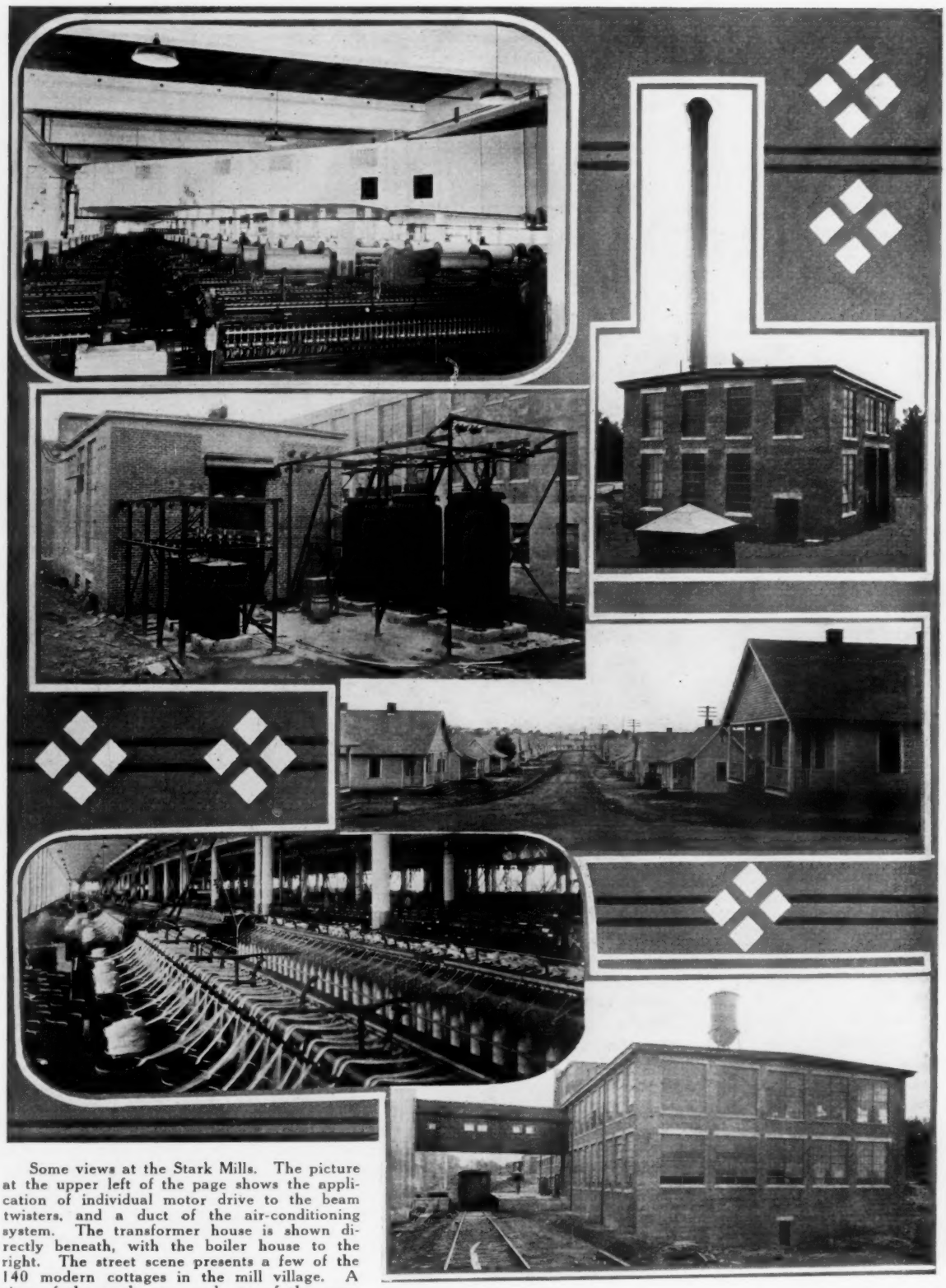
The traveler on the Atlanta and West Point Railroad, which passes through Hogansville, might have casually noticed, around the middle of June, 1923, workmen engaged in breaking ground for a building of some kind. Passing through again less than seven months afterward, he would have marveled to see a modern three-story mill building, practically completed, with looms installed and operating. The finishing touches were applied to the building, and other machinery installed, so that the entire mill was completed and in operation in eleven months from the time the ground was broken.

At Hogansville also is the Hogansville Mills Division of the New England Southern Mills, both plants being now under the management of John A. Baugh, Jr., as agent.

In describing the Stark Mills Division at Hogansville, it may first be stated that practically all of the machinery installed was removed to Hogansville from New England mills of the corporation, at Lowell, Massachusetts, and other points. The equipment as completely installed consists of 35,568 spinning spindles and 121 looms, the principal product being automobile tire fabric material.

The accompanying photographs show some views of the mill building and interiors, illustrating it as a plant of modern construction and arrangement. The main building is 550 by 130 feet, three stories high, with basement extending half its length. Re-inforced concrete skeleton construction was used, with wood floors, and cork insulated roof. A. J. Krebs Company, Atlanta, Ga., were the contractors for the skeleton of the building, while W. P. Francis, of Atlanta, Ga., was contractor for the floors and brick work. David Lupton's Sons Company, of Philadelphia, furnished the steel sash for this building. The roof was furnished by the J. A. Piper Roofing Company, Greenville, S. C.

Located near the main mill building, and connected with it by a passageway, is a brick building used for storage, and as an opener and picker building. One-half of this building is constructed with four stories of eight-foot ceiling height, which are used for cotton storage, while the other half consists of two stories 16 feet high, the lower of which contains the opening equipment. The upper story of this section houses the pickers or lappers. The



Some views at the Stark Mills. The picture at the upper left of the page shows the application of individual motor drive to the beam twisters, and a duct of the air-conditioning system. The transformer house is shown directly beneath, with the boiler house to the right. The street scene presents a few of the 140 modern cottages in the mill village. A view of the card room and one of the combination sttorage and opener-picker building are at the botttom of the page. The passageway through which the finisher picker laps are transported by truck from the picker building to the card room on the second floor of the main mill building is shown

contractor for this building was W. P. Francis, of Atlanta.

Finisher picker laps for the cards are transported by hand truck through the covered passageway into the card room on the second floor of the main building. All the card room machinery is located on the second floor, from which the roving is carried to the spinning room on the third or top floor, where also are the beam twisters and spooling equipment. The yarn ready for the loom is taken to the weave room on the first floor. This transportation is done by truck and elevator, there being two elevators in the building installed by the Reliance Elevator Company, Chicago, Illinois.

On the first floor, also, the woven cloth is inspected and packed for shipment. An interesting feature of the cloth room is a battery of "dark-rooms" which are small booths located in the center of the department. These are equipped inside with cloth inspecting machines, a row of electric bulbs being placed under a glass surface over which the cloth is inspected. The nature of the goods made, and the purpose for which they are used, require unusually rigid inspection. This method allows the operator to shut off all outside light, inspecting the cloth before the high-powered electric lights in the machine. Following this operation the cloth is again inspected in the usual manner.

The outstanding feature of construction at the Stark Mills is the air conditioning system, which was designed and installed by the Parks-Cramer Company, of Fitchburg, Massachusetts. This is of the central station type, and combines the functions of ventilating, heating, air washing and humidifying—and is entirely automatic in its operation.

This system differs from the familiar high-duty or spray-head manner of humidification in that all of the equipment is located in a unit on the roof of the building and the humidified air is passed into the rooms from large ducts, with openings in the sides at regular intervals. At the Stark Mills there are three of the central station units, two located at one end of the mill, and one at the other. Incidentally, the arrangement of the washers on the roof avoids costly flue construction in the basement and side walls, and is considered an advanced step in design where this system is used.

Two of the air washer units, located on the roof at one end of the mill, furnish air into a central concrete duct which goes down through the three floors of the mill about one-third of the distance from the end. The other washer supplies a concrete duct leading down from its separate pent house on the opposite end of the mill.

Since the greatest demand upon a central station system occurs only during a few months of the summer, arrangement has been made whereby one of the two washers which are in parallel on the larger flue may be shut down during winter, and variable speed control on the fan in the separate pent house at the opposite end of the mill permits the air handling capacity of this fan to be reduced during the winter months when great cooling effect is not necessary.

Each of the humidifier spray chambers on the roof is equipped with spray nozzles which saturate the air, and with eliminator plates which insure dry saturated air passing down into the ducts. The bottom of each humidifier forms a tank divided into two parts: a clear-water section and a filter section. The make-up supply water taking the place of that which has been evaporated, enters the clear-water section of the tank. The filter section is filled to a depth of 24 inches with a specially prepared smooth quartz gravel through which all the water that has passed through the spray chamber passes on its way to the clear-water tank before re-circulating. Vertical flues were provided in the construction of the building which return the air from the different departments to the fan rooms during the winter, and waste the air during the summer when it has absorbed a high heat content.

Fire and volume dampers are provided in all the ducts for safety in case of fire, and in order to control the volume of air passing into the different departments. These fire dampers are held in their proper location by fusible links which melt under fire conditions, thereby closing the dampers.

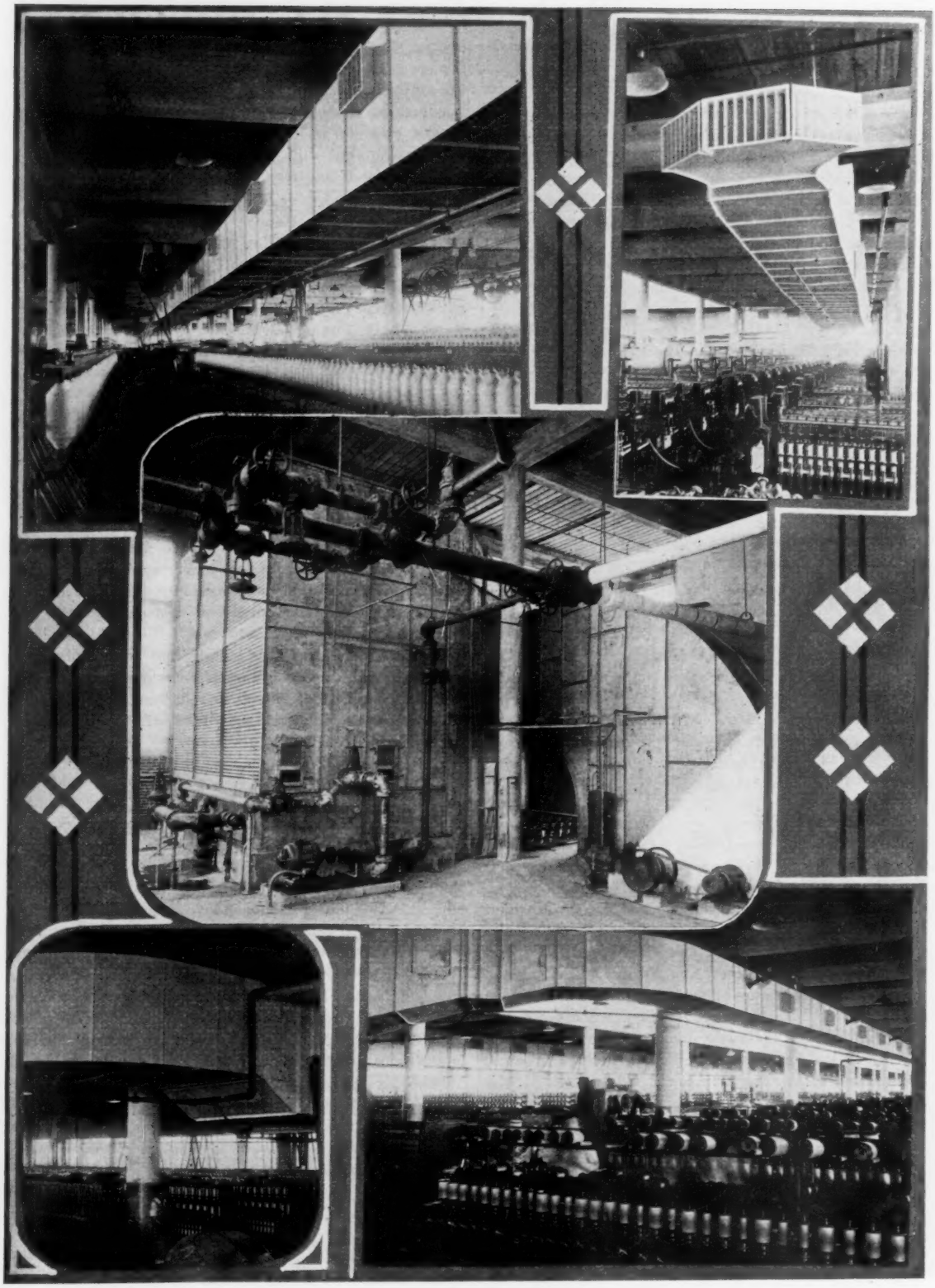
Another interesting feature is that a duct connection is made from the third or top floor of the main mill to the picker building to provide humidity and to replace the air removed by the picker fans. A combination fire and volume damper is provided in this flue and can be operated manually to control the air volume.

Since the value of a modern humidifying system is largely dependent upon automatic humidity regulation, the system of regulation at this mill is perfected to a high degree. The automatic humidity and temperature regulators control the fresh air dampers, the return air dampers, the waste air dampers, at each fan; steam to increase the saturation temperature, volume dampers to each manufacturing department, and steam supply to indirect heaters in each department. The relation between these various control mediums is such that it is impossible to over-humidify during cold or rainy summer weather. Since a constant circulation of air is necessary to produce the desired working conditions this system of regulation was designed to interfere as little as possible with the supply of air to the room, but to so condition the air as to produce the desired humidity and temperature.

The combined air handling capacity of the three washers is in excess of 600,000 cubic feet of air per minute, and under maximum demand conditions such as would be produced with an outside temperature of 96 degrees F. and about 30 per cent relative humidity, the three washers are capable of evaporating approximately 2,000 gallons of water per hour.

One indication of a mill's progress in the present age may be taken from the application made of testing equipment. The Stark Mills are well equipped from this standpoint, having provided on the first floor of the mill a separate room as a laboratory under the charge of an expert. As tire fabric and similar material must pass most rigid requirements, it is expedient that as complete and perfect a product as possible be turned out at the mill—and adequate and thorough laboratory tests are invaluable in this connection.

Included in this equipment of the Stark Mills is the following: an eight-basket Emerson oven; a Scott power-driven 400-800 pound autographic cloth breaking machine; a Scott 150-300 pound automatic power yarn tester; a Scott 50-pound single strand cord tester; a Brighton crimp tester; a Suter twist counter; a Tycos sling psychrometer; a Comins psychrometer; a Brown & Sharp 1½-yard reel; one pair Brown & Sharp yarn scales; one pair 10-pound capacity torsion balances; a Randall & Stickney cloth gauge; a yarn conditioning rack, and all charts, tables, etc.,



These five photographs illustrate the central station system of humidifying, ventilating, heating, and air washing, at the Stark Mills at Hogansville, Georgia. The large picture in the center shows one of the air washer units on the roof of the mill. The four other views show the ducts for distributing the conditioned air to the various rooms in the mill.

necessary to the accuracy of laboratory work.

The laboratory is separately humidified, so that any desired relative humidity for testing may be maintained regardless of the humidity condition of the remainder of the mill, or of the outside weather.

The mill is driven by electric power, and a large portion of the machinery operates from individually connected and four-frame group drive motors. The Columbus Power Company, Columbus, Ga., supply the current from their Goat Rock station. An item of interest in connection with the Stark plant is that the power company erected a new $100,000 substation, of 3,000 kv.-a. capacity, about two miles from Hogansville, to provide sufficient power to operate the new industrial unit. This station, of course, is capable of furnishing power for other industries.

J. M. Clayton Company, 5 Cone Street, Atlanta, Ga., were the electrical contractors. The current is fed to the mill at 11,000 volts, passing, in the switch-house, through an automatic oil breaker, then through a bank of three 833 kv.-a. General Electric Company transformers, being stepped down to a secondary voltage of 575 volts. It then re-enters the switch-house, where there are nine power panels, through which the power current leaves the switch-house underground by way of Parkway cables, furnished by the Standard Underground Cable Co., of Pittsburgh, Pa.

The lighting current leaves the switch-house in exactly the same manner, except that the lighting is fed at three-phase 220 volts, using balancing coils on each feeder in the mill. Furthermore, the lighting is held at constant voltage by a regulator in the switch-house. There is also a 1,000 kv.-a. synchronous condenser on power.

All sub-feeders or mains which supply the motors are protected by fuses on Westinghouse distribution panels. As stated, practically the entire installation of machinery was removed to Hogansville from eastern plants; the twisters, being individually driven, came with the motors and chain drives provided. The spinning machinery was laid out for four-frame drive, and for this purpose a sufficient number of General Electric Company motors were secured. All the major electrical equipment, unless otherwise specified herein, was furnished by the General Electric Company.

Galvanized conduit was used throughout the electrical installation, this being furnished by the Youngstown Sheet & Tube Company, Youngstown, Ohio. All R C and V C cable wire was furnished by the American Steel & Wire Company, 60 Church Street, New York City.

An interesting feature of the lighting installation is that it was planned for general illumination throughout the entire plant; that is, adequate illumination is given in any part of the building to provide for any possible future rearrangement of machinery. About 1,400 Ivanhoe RLM reflectors, ranging from 75-watt to 200-watt capacity, furnished through the Carter Electric Company, Atlanta, are used for this installation.

Two 250-hp. boilers, installed by the R. D. Cole Mfg. Co., Newnan, Ga., furnish steam for heating through the Parks-Cramer conditioning system. The Rockwood Sprinkler Co., of Illinois, furnished the sprinkler and general fire protection equipment. H. M. Jackson Company, of LaGrange, handled the plumbing installation. The shafting and pulleys, etc., were furnished by the Golden Machine and Foundry Company, Columbus, Ga.

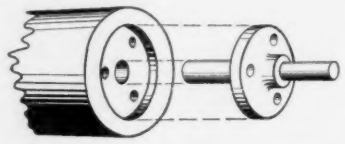
Some surplus houses in the village of the Hogansville Mills Division were utilized for Stark Mills operatives, but in addition, 140 cottages and a superintendent's home were erected, the contract for this being handled by the LaGrange Lumber and Supply Company, of LaGrange, Ga. The operatives' houses are of three-, four-, and five-room construction, inside walls are plastered, and each house is covered by a roof of Richardson composition shingles. Each house is equipped with electric lights, running water, and bathrooms and toilets. The plumbing fixtures in the houses were installed by the Black Plumbing Company, of LaGrange, Ga.

The sewage facilities for the village were laid by the Dysard Construction Company, of Atlanta. A deep, 10-inch well was drilled for the water supply, and a 150,000-gallon reservoir at the top of the ground furnishes the water supply; this was constructed by the LaGrange Lumber Company. A 50,000-gallon tank on the hill, furnished by the R. D. Cole Mfg. Co., provides ample pressure for the village water supply.

Lockwood, Greene & Company, Engineers, of Boston and Atlanta, were engineers and architects for the entire work.

The Rodney Hunt Machine Co., Orange, Mass., has placed on the market a new style of immersion roll known as the "Renu-Journal" roll. As the name implies, the journal part of these rolls are quickly renewable. The advantages are similar to those back in the days when automobiles were first equipped with demountable rims and tires.

For some time the textile industry has been laboring under the expense and annoyance of break downs and too frequent replacement of immersion rolls because the journals wore excessively or sometimes broke off. Until now, the



only remedy has been to replace the entire roll or to repair the defective part—both of which proved to be very expensive. In the case of the "Renu-Journal" roll these worn journals are quickly replaceable and the roll goes back into service to give its full value.

The "Renu" journals themselves are standardized and produced in quantities so that all of one size are interchangeable, and new journals can be set in a surprisingly quick time. Any metal is furnished including steel, bronze, monel, etc., making the roll adaptable to many different uses. The cut herewith makes description unnecessary.

"The Dyeing of Anthrene Colors on Cotton," "Newport Colors for Dyeing Artificial Silk," and "The Carbonization of Wool Fabrics with Neomerpin-N," are the titles of three recent technical bulletins which the Newport Chemical Works, Inc., has mailed to holders of their binder.

Truscon Steel Company, Youngstown, Ohio, recently issued a new bulletin relative to their industrial doors, of the swinging and sliding type, which contains helpful information with reference to sizes, etc.

Scientific Trends With a Textile Slant

Industry's Greatest Problem.

To keep down the cost of basic materials, and still improve their quality, is the greatest task before the business of production. So many basic materials of production and maintenance have doubled in cost during less than a decade that they become at once a menace to profits, to the purpose in which they are employed, and to the very existence of business.

Purchasing on a comparative (composite) basis of utility price, as well as national professional engineering efforts to rectify this situation are but part of the task.

This era of manufacturing is to be marked by marvelous developments in automatic, centralized control of process. It has been plain for some time that this was the inevitable direction toward which inventive industrial activity would be turned, and the situation and demand is such as to make it a necessary intermediate step prior to embarking on the great projects for improvement of style and quality which will put luxuries in textiles within the reach of even the modest budget.

The attitude of labor toward production of standardized quality, the necessity for the elimination (to personnel) of hazardous and disagreeable processes, and the dependence of costs upon fixed conditions of manufacturing all demand this stabilizing element in the plan of operation.

It is necessary to disabuse the mind of the belief that the development of such specialized jobs as "gauge-watchers" will add to the expense of operation or increase the difficulty of managment. Indeed, the problem consists of a changeover similar to that by which a manager ceases to depend upon his versatile memory and carries an indexed notebook around with him to refresh his memory on the tasks to be done. Central-station automatic process-control is a permanent notebook that can't be lost—enabling an executive to fix all his attention upon evalution and disposition of the complete and accurate data this gives him. It increases the value of his judgment and experience—makes it a scientific thing as deep-rooted as laboratory findings. And the cost of realizing its installation is less than that of a few spoiled lots caused by unstandardized methods.

The plant executive, co-operating actively with his technical and production executives, must bring detailed conditions of use to the notice of manufacturers of these products, and *stay with them all the way,* to the working out of specific usefulness of each item, elimination of useless members (and still more useless phantasies of products which exist only because they are well "salesmaned") and the shortest, most efficient standard method of applying each.

There is no royal road to the solution of this rising-cost-of-materials problem but the procedure outlined will do much to cast out the dross accumulation of the last few years and to make for and maintain a general policy of "debunking."

Specialization in the production of materials used in maintenance and manufacturing processes is highly desirable—no one desires to thwart the initiative which may be productive of revolutionary discoveries—but the chief function of the mill purchasing-analyst is about to become one of using a "big stick" on nearly similar lines offered for the same function.

Planning Backwards.

An enormous bank has just purchased valuable property in the heart of one of the most expensive commercial districts "to protect its light." Many a mill does the same thing—without, perhaps, being aware of it.

It is more certain each day that no piece of mill property should ever get off the draftsman's board until a competent illumination man has passed on it, (and one who knows factory practice as well) from the point of view of its own efficiency, its effect on adjacent construction, and the likelihood of future developments.

Much costly alteration and operating expense are involved yearly in avoiding the tangles to which an earlier shortsighted planning has committed the owners. Frequently "a window in time saves nine" and it takes many kilowatts to offset three feet of stone wall.

Investment versus Maintenance

It takes more effort to save one thousand than one hundred dollars and it is frequently necessary to have recourse to temporary expedient, lacking the means to provide for the last word in a permanent one.

Nevertheless, in these days when the textile industry is taking stock in all lines and girding its resources for the problems it has to face it would be well to compare the costs of repairs and preservation of flimsy construction against the spread-over of investment in permanent construction.

Experience shows that, with the rising costs of labor and of preservative and repair materials, it costs more, over a period of forty odd years, to *maintain* flimsy construction and installation than to actually build in the materials of the highest type—and this figure includes the interest on investment in the superior materials. What wooden frame mill is a first class risk after fifty years?—but many brick and stone ones greatly exceed that span of life. This truth holds good all along the line—from walls to pipes and acid-containing vessels.

A going concern can not afford to add any item of regular plant or equipment on less than a forty year basis and it is to be hoped that new mill projects are little enough of a speculation to plan their span of existence otherwise than for at least such a period.

Maintenance of Overhead Lamps.

To get back to lighting for a moment, while on this question of maintenance, about the only reason for buying reflectors at all for overhead industrial lamps is the expectation of saving just about one-half of the light that we know the bulb is producing, approximately half of which goes up, and half goes down. A clean reflector will save pretty nearly all of the upward light, while a dirty reflector will not save any—nobody has ever found any kind of dirt that will reflect light.

The greatest problem in reflector-cleaning is accessibility and when we stop to consider what the reflector-cleaner has to do to get at many of the overhead lamps as they have been installed heretofore, it is easy to understand how it happens that so much money has been lost—wasted—in industrial lighting.

Obviously the most logical solution of this problem is to make the work easy and safe by installing certain types of overhead lamps on a safety lowering switch, operated from the ground by a rope or chain. Then instead of doing any climbing at all the lamp-cleaner pulls the chain, whereupon the lamp automatically disconnects from the electric circuit and comes down free, and dead. The cleaning is thus done in safety, with convenience and efficiency, down on the ground. When the lamp is pulled up again it goes automatically back into the circuit and locks. This not only eliminates the climbing hazard, but also any electrical hazard, for the lamp-cleaner is kept entirely out of reach

of the electric circuit.

While the use of a safety lowering switch increases the cost of the installation somewhat, that is exactly true of the reflector, for it also adds to the cost of the installation. The reflector costs more than the bulb and it does not "produce" any light; that is done only by the bulb; and only a clean reflector will save any light. Yet if most anybody today had a plant full of bulbs without reflectors it is reasonable to assume that he would not hesitate to go ahead and spend whatever he had to spend to put a reflector on every one of those bulbs. Now we might pause for a moment to wonder just why he does it! He will not be producing any more "light" than he had before, and unless he keeps the reflector clean he will not save any light. But the answer is that the public mind has now become educated to the "idea" of a reflector, just as the public mind has become educated to the idea of conduit, conduit fittings, fuses, etc., all of which add enormously to the cost of the installation—the only question now is "what kind." If the bulb had been sufficient without the reflector it is a certainty that the reflector manufacurers would never have made any headway with their product.

The combination of bulb and reflector will give marvelous results when new—while they are clean and bright and sparkling; but their efficiency falls off with every particle of dirt that accumulates. While it is impossible to prevent the dirt from getting on the lamps, we do not have to let it stay there, though we probably will if the lamp is installed where nobody can do the cleaning without great difficulty or hazard. The modern industrial lighting unit costs too much for merely temporary results, and it is too good a piece of apparatus to be wasted.

Is it not reasonable therefore to add enough to the installation to make it work, and to enable it to give the continuous results of which it is capable?

An Investment in Surety.

Safety and assurance that your methods are sound, your reasoning logical and your decision based upon the best last-minute progress of the times are yours when you work from a reference background prepared by a skilled search and compilement specialist.

The plant library ought to be the most valued and valuable piece of machinery you have—turning out a production which is shortly reflected in actual dollars of economy, improvement, or new opportunity.

Some excellent librarians are buried under a policy of: "Why, yes, we have a reference library, and it clips our magazines and routes matters of interest to the various departments, etc."

Eighty-eight per cent of all the librarians in the country are women—a selected class of cultivated, highly-specialized professional people capable of assisting progress and directing thought into extremely profitable channels. Versatility and a totally different viewpoint from that of men will make their special skill of inestimable value in a manufacturing business—particularly in one dealing with a product so near to the hearts of all women as that of fabrics.

Ultimate Basis of Policy.

In the emergency of foreign competition, rising costs and inadequate outlets faced by the textile industry, pause to evaluate the proportional place fittingly occupied by each textile material is "altogether fitting and proper."

The ultimate utility of each textile fiber to the specific uses for which it is best adapted is a status quo not to be *permanently* altered by advertising and selling, but only through refinements and extensions of the essential efficiency or application of each one.

It takes many cubic yards of loose feathers to balance the weight of a very small coil of twisted hemp—yet a few handfuls of eiderdown preserve life warmth in the Arctic regions, and no one has yet made a ship's hawser out of even a vast supply of feathers.

Extremes, yes, and so are many of the attempted forced uses of several of the basic textile fibers. A quart funnel of liquid is half full when considerably less than half its depth is arrived at. Perhaps the big hosiery makers who complain that their trade is suffering so badly from house-to-house canvassing may find a clue to the solution of their troubles in study of this basic thought.

Cotton's Golden Opportunity.

Merchandising, misplaced emphasis in marketing other fabrics, unjustified representation of fitness of fabrics in fields to which they are not adapted and many similar errors in policy have resulted in a condition from the midst of which the position of cotton is in a higher state of supremacy than it has ever been before.

While other textiles were being manipulated, stretched, glossed, and otherwise generally made to appear what they were never intended to be, the cotton industry has slowly but surely forged ahead on a consistent policy of improvement in *basic* matters—development of machinery, perfection of sound, tried methods, consistent reduction of central costs, better handling, in short, of many of the *fundamental* problems of the industry instead of wasting energy upon will-o-the-wisps.

Nowhere is this more strikingly portrayed than in the earnest wish of its rank and file of responsible executives to improve their individual daily problem—a condition that, in number and degree has no equal in any other branch of the textile industry. This is the keynote of every issue of COTTON, reflecting and inspiring every section of the industry.

Nothing else can result from this other than the firmly established supremacy, in the textile market, of the fabric itself. For that reason we shall confirm and strengthen the industry in its policy of consistent, gradual, secure progress—and not permit it to be led away one iota into those mistaken policies of wasting energy on unadaptable fields and similar blind alleys, from which other branches of the textile industry have suffered so materially.

What We Get for Our Money.

The things one can purchase for small amounts in a good department store are a never-ending source of amazement to the thoughtful person, especially in view of the *service* of many varieties these stories offer. This, as anyone knows, must be charged into the expense of doing business.

One large store provides twenty-three items of free holiday service, for which it maintains personnel, equipment and valuable selling space—and space in a department store has been known to be worth two dollars per square foot, per day.

These little (and costly, to the furnisher of them) services are what add to the enjoyment of life—make it smooth-running and more livable. Whenever we pay any price for a manufactured article we ought to be willing to pay, with it, a small percentage of its value to keep up this

tendency for better living. At any rate, it is up to us to choose for ourselves whether the price of an article is or is not worth while in terms of the better living it affords us, in general, in paying it, and if it is not merely a fair rate of interest upon an investment in better living that has been provided for us by people with a large vision for the general welfare—a degree of better living that we, individually, could never hope to purchase for ourselves on an income of twenty-five thousand dollars a year.

Public Responsibility.

The responsibility of wealth is one thing, and a very real thing, at that. In view, however, of the tremendous uplift in life and living that many of the large mill activities have brought to their community it is about time that a balance began to be struck.

When a business institution, with all the risks and effort entailed therein, has had sufficient vision and courage to endow hospitals, schools and other activities of unquestioned contribution to the general welfare, and has put in the investment required to maintain them, for the sole purpose of making a better community to live in, it seems to us that that *whole* community, whether or not employed by the business, owes it to the betterment in living that results, to contribute a goodly proportion to their maintenance, when and as such community may be able.

A community lacking these benefits is little better than a tribal settlement—those groups of people who enjoy such benefits, therefore, owe it as their share in civilization to be thankful that they were given the start in procuring them, and to do their share in seeing that they continue.

It is not good public policy that even an endowed institution of public service should continue to be thus far removed, in fact, from the ideal of public maintenance.

The Port of Charleston

BY R. S. MAC ELWEE, Ph.D.
COMMISSIONER OF PORT DEVELOPMENT, CHARLESTON, S. C.

It is an axiom of economics that the ultimate price is the controlling factor and that this price cannot permanently sink below the cost of production, which is made up not only of the cost of manufacture, but of transportation through the market. Cotton mills, cotton finishing plants, gins and compressors of raw cotton, all have striven to reduce the cost and increase the quality of their operations. Have all these industrial experts that have achieved such progress given thought to the fact that an uneconomical routing of their products will wipe out all the progress that has been obtained through lower costs and better quality of production? It is also axiomatic that the cost of transportation has increased by two hundred or more per cent in the last decade without hope of any appreciable reduction in the future.

The question of the routing of shipments the short and economical road to the Port of Charleston is at least an equal value with the refinements of production in the thriving Piedmont mills. Take first the shipment of grays to northern finishing mills. Although there is no indication that this movement will increase materially, due to the rapid rise of modern finishing plants in the South, yet, this item of cross-hauling adds greatly to the total cost of the product in domestic and foreign competition. Formerly, there was only one sailing a week from Charleston to Boston as against more frequent sailings from Norfolk. This frequency of sailing, which relieved the traffic man of calculations, allowed him to forward his goods without any particular worry as to sailing schedules out of Norfolk, and the more frequent sailings from Norfolk were used as an argument to get this business. However, the Clyde Line now has two sailings a week each way between Charleston and Boston and four sailings each week each way between Charleston and New York, with a newly inaugurated service between New York, Charleston and Miami. Two new ships have been added to the New York run and this company has made arrangements for transshipment through bills of lading to various lesser New England ports; while the Baltimore and Carolina S. S. Company gives frequent service between Baltimore, Charleston and Miami.

In line with similar textile service to other distributing points in the East and Middle West, the Southern Railway has in operation a special rail service for the carrying of textiles from the southeastern mill points direct to the Port of Charleston. This specialized and quick service gives an equally satisfactory through service via the Port of Charleston for less freight money than if shipped through many of its competitor ports or if an all rail haul were used.

At this point it is well to stress the careless use of bale hooks by truckmen and longshoremen in handling textiles and other baled merchandise in the course of coastwise shipments. This has become so important a factor in the transportation of these commodities as to call for nation-wide action on the part of national trade associations and to gain the attention of the New York Journal of Commerce and the New York Commercial in an attempt to eliminate the damage done.

The principal carriers out of the Port of Charleston, pioneers in the safe handling of textiles, long ago eliminated the hook hole menace by the simple expedient of eliminating the hook. Other important handling reforms were inaugurated.

Cotton piece goods, moving from rail to shipside or through warehouse at Charleston, are handled without hooks and Charleston was one of the first textile ports to insist on butt-end placing of piece goods on all cars, sheds, and vessels. This advantage alone is sufficient to move piece goods through Charleston, even though the rate were higher than through some other less careful port. But fortunately, Charleston adds to perfection of service, advantageous rail rates, and especially is this exemplified in its rates on cotton piece goods moving to the Port of Charleston from southeastern mill points for transshipment to Pacific Coast terminals via the Panama Canal. Moving on an intra-state rate from certain South Carolina mill points, a saving of from one to twenty-six cents per hundred pounds in favor of Charleston is had over certain competitor ports, and parity rates or better are to be had

from the majority of other important points of origin within the southeastern district. The American-Hawaiian Company, having recently made Charleston its South Atlantic port of call, has intercoastal sailings via the Panama Canal every three weeks to the Pacific Coast terminals of Los Angeles, San Francisco, Oakland, Seattle, Tacoma, and Portland, the great 10,000-ton steamers operated by this line being particularly suited for the transportation of textiles. The advantages of this coastwise and intercoastal service in widening market possibilities by reducing ultimate cost to consumer are obvious.

In the matter of foreign commerce, Ernest Filsinger, the foreign manager of Lawrence and Company, one of the most practical as well as the most intellectual of all the foreign trade fraternity, stated that he believes that the margin of economy in a direct shipment from Southern mills through the next adjacent port, in particular, to the Far East, will be sufficient to offset the cut under American prices made by European competitors. The U. S. Steel Corporation has seen the advantage with regard to their products, and in October, 1924, with the sailing of the *Steel Age,* followed in November by the *Montgomery City,* with the *Ensley City* scheduled for December 1st, and the *Steel Ranger* for early this month, has inaugurated a regular monthly service to the ports of Kobe, Yokohama, Dairen, Shanghai and Hongkong and Osaka. Cotton in large quantities is already being booked for this direct service, but textiles have not yet taken advantage of the new service.

The Carolina Company of Charleston has been awarded the operation of the consolidated South Atlantic Shipping Board ships to be known as the "American Palmetto Line" to United Kingdom and Western European ports. Large quantities of raw cotton, cotton linters, cotton seed and cotton mill sweepings as well as general cargo are moving through Charleston to British and Europeon destination. The Von Dohlen Company has inaugurated a line, the first service was last November, to United Kingdom and Continental European ports. Bi-weekly guaranteed service is had to Rotterdam and Antwerp and monthly service to Bremen and Hamburg.

These services, coastwise, intercoastal, European and Far Eastern, are now sufficient in number to attract cargo, as shown by the fact that the foreign commerce of the port increased 60 per cent in 1923 over 1922, and will show a large increase in 1924 over 1923. Shipping is attracted to a port by favorable rates to the port and frequent steamship services from the port. Rail rates have been gradually straightened or are in the process of adjustment, and the steamship services have been established. The start in establishing regular services of liners shows that other lines will be established and it will only be a matter of time at the present rate, until both South American coasts, and the ports of the Caribbean, Gulf and Mediterranean will be served.

The third item in the trinity of traffic is terminal facilities. The United States Government during the World War built the great port terminals at North Charleston, and the City of Charleston, through its Port Utilities Commission, is just completing a million dollar pier known as the Union Wharf. These thoroughly modern facilities afford not only the maximum speed in handling and low wharfage and warehouse rates, but also very low insurance rates. In fact, mills can store their products in the modern fire resisting, sprinkler protected warehouses of the port terminals, comprising 1,500,000 square feet of the finest kind of storage, for textiles, cotton, and cotton products, at a lower rate of warehousing and insurance than could be realized on warehouses of their own if they constructed them for this purpose. The great port terminal warehouses not only afford shipside concentration for coastwise, intercoastal and export shipments, but give a cheaper warehousing service than the mills themselves could provide. This is due, of course, to the fact that the Government built the terminals as a war measure with far greater capacity than post war commerce can utilize, and the rates are based on the war cost of amortization of the investment.

It might be added that with the growth of finishing mills in the South that textile manufacturers can well give more attention to their export business. It is quite uneconomical to haul grays to New England, finished goods back to New York, and export them, to scattered markets, through a commission house, when the same goods can be finished in the South, shipped through an adjacent southern port, and go directly to the foreign customer at a much lower price in the foreign market. This will mean that the mills can compete against the world in overseas markets. It is the last fifteen or twenty per cent of the production of the mill, or in general, the production of the nation, that makes the difference between breaking even and paying dividends If the market of the American textile mills can be expanded to even ten per cent of the total production through the new order of goods finished at the mill and exported through the short route of the nearest port, the entire industry should be quickened as a reaction from the stimulated demand of foreign markets made possible by these economies.

The commission house is a necessary institution and it may be a long time before mills will do their own exporting, nevertheless, someone in each mill should make it his business to check up on the commission houses that are handling their goods to see that the economies of direct shipment are realized and that the goods themselves are physically moved through the nearest port, regardless of the location of the commission house selling and financing them. In this connection, Charleston is building up capable forwarders and capable foreign departments in its banks. Why should not the Piedmont mills organize their own cooperative export commission house, warehouse their goods at shipside in these unusually cheap, modern Government terminals, and take advantage of the lower rail and water rates to destination? Such a commission house, run either on a cooperative plan or a preferred participation plan by several of the leading textile plants manufacturing goods suitable for export, and, for that matter, for coastwise and Pacific Coast sales—this does not leave many out of the picture—should bring renewed profits to the mills at this time when the textile industry needs to profit by every advantage.

The name of the Sandusky Foundry & Machine Co., Sandusky, Ohio, has been changed to the Paper & Textile Machinery Company, it is announced. No change in ownership, management or policies has been made. This action was taken that the name might more clearly reflect the company's product, it is stated.

Making Cotton Wicking for Candles

Some Notes on an Obscure but Highly Specialized Branch of the Textile Industry

BY G. E. VAN TROMP GOVIER.

Few people interested in the manufacture of cotton textile products realize the magnitude of the industry of preparing cotton wicking for candle manufacture. Neither would it be surmised, on the surface, that the processes involved in the production of this material are intricate, and of a very technical nature.

In this country, where practically every other from of illumination has given way to electric lighting, it is difficult to realize that there exists throughout the world an enormous, and prosperous industry such as that of manufacturing candles.

Nevertheless, this is so. Great quantities of candles are used in the Orient, South America, Continental Europe, and Africa. England uses very large quantities of candles, while even North America, when one considers the number of churches which use them in their ceremonies, consumes a surprisingly large amount.

One of the most important factors of this industry is that of the preparation of the wicking.

It must be made from carefully selected yarns, thoroughly freed from impurities, and with the maximum capillarity. And when the wick has been prepared, it must be expertly treated chemically to suit the type of candle for which it is designed.

Candles are made from numerous types of fats and waxes. Usually the cheapest or most easily obtained material, in the locality in which the candles are being manufactured, is used. Tallow, of course, was the earliest fat to find its way into this industry, while spermacetti, stearin, ceresine, ozokerit, and paraffin have all followed in line. Bees' wax has been used since the earliest times, but today liturgical candles are about the only ones which are prepared from this wax.

Candles made from any one of these fats or waxes, or from mixtures of them, require an absolutely different wicking in each case. This problem of diagnosing the best wicking together with the best chemical treatment, to suit each manufacturer's different candle material constitute difficulties which can be only overcome by long experience or research.

Our earliest candles commercially produced were familiarly known as "dips." They were prepared by dipping lengths of coarse twisted yarn into buckets of molten tallow, each operation of immersion in the molten fat, and withdrawal for cooling, depositing a new layer of fat to the candle. In this way a candle was built up, until a cross-section of the resulting "dip" gave an appearance similar to that of the cross-section of a tree—a quantity of rings, one inside the other.

The twisted yarn used in these early "dips" was not chemically treated in any way. This development had not yet arrived, and consequently the illuminating powers were poor, there was heavy smoking, guttering was frequent, and snuffing had to be resorted to.

Bees' wax candles were rolled by hand.

Then came the moulds, and the braided wicking. The latter was a very great improvement on the early twisted yarns, but left much to be desired. It was merely a core of different thicknesses, braided. Occasionally a weak fireproofing treatment was given, but with no definite object in view. When burning, the wick stood straight up, either consumed too rapidly, or not at all, collected large deposits of carbon in the form of a "mushroom" and smoked vilely. The carbon would drop in the cup of the candle, and guttering commence. The secret of making the end of the wick bend over, and stand out from the flame could not be found. Metal wire "guts" were inserted in the braided wick, but without much success, although in a good many cases improved results were obtained. "Snuffing," however, still was necessary.

The greatest development came at the time of Queen Victoria's Diamond Jubilee, when Fields invented his famous "snuffness" candles, and placed them on the market to celebrate the occasion.

These candles were prepared with a special wicking, hitherto unknown and prepared by flat plaiting a number of ends of yarn, the flat plait causing the wick to automatically bend from the flame as the burning progressed. The wick was also given a fireproofing treatment, to a certain degree, and the result was that the whole of the cotton was volatilized, no carbon formed, and snuffing dispensed with. This revolutionized the industry.

Comparison of Braided and Plaited Wicking.
EQUIVALENTS IN WEIGHTS.

Braided Wick			*Plaited Wick*	
Number	Ends		Count	Yarn
1	22		3/12's	24's
2	22	Equal to	3/14's	24's
3	22		3/16's	24's
4	22		3/18's	24's
5	22		3/20's	24's
6	22		3/22's	24's
7	22		3/24's	24's
8	33		3/26's	24's
9	33		3/28's	24's
10	33		3/30's	24's

The success of the plaited wick was immediate and thorough. Similar plaited wicking is used today, and practically the only developments have been in the chemical treatment of the material to give maximum results in all varieties of candles.

The production of this material is carried out mainly in the United States, England and France. Of recent years there has been some activity in this direction in Japan, but it is doubtful if any of their material is exported. England, probably, is the largest manufacturer of wicking, having a very large export trade, particularly to India and South America.

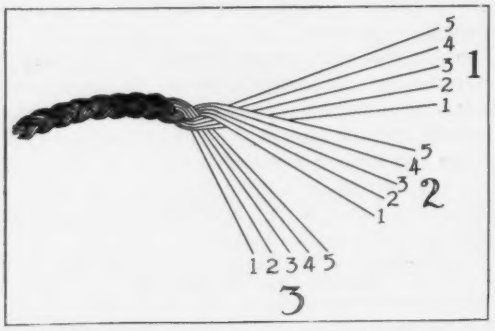
The wick is plaited in the grey. The number of yarn used most extensively for this product in England is 26s. The wick may have any number of ends, from, say, 9 to 240, according to the diameter of the candle for which it is eventually to be used.

The designation of the counts of the plait in England is made according to the number of ends in each "ply" of the plait. Thus, a wick made up of thirty ends of 26's yarn would be a plait of three "plys," each containing 10 ends of yarn. This would be called a 3/10's wick. A plait containing 36 ends of 26s yarn would similarly be three "plies" of 12 ends each. This would be named a 3/12's wick. And so on.

3/8's, 3/10's, 3/12's and 3/14's are the sizes having most popularity. 3/10's and 3/12's are particularly in demand, and very large quantities of these counts are prepared. They are the sizes required for the manufacture of the typical household candles used in large quantities all over the world, and usually of a composition of stearin and paraffin, or paraffin alone.

The finer counts, viz., 3/4's, 3/5's and 3/6's, all out of 26s yarn, usually find their way into small decorative candles, or in peculiar small paraffin candles used in enormous quantities in the Orient.

Coarser counts, from 3/16's to 3/50's, may be made of 26s yarn, or even heavier yarns such as 20s or 14s, according to the heaviness of the wicking desired. These counts



Showing a section of a 3/5's plait and illustrating the method of designation.

usually go to the preparation of liturgical or ceremonial candles, and, as a general rule, do not give as good burning results as the smaller counts.

The plaited wick is wound on hank winders to hanks of different lengths, the reason being, that if the wick has to be spooled for shipment, candle manufacturers generally specify a spool of certain dimensions, according to the requirements of his candle machines. Different length hanks give various sized spools.

Quite a number of candle makers use the wick unbleached, and in that case it has been my experience that the wick manufacturer rarely spools the wick. In the case of it being bleached, it goes to the bleachery in the ordinary way, and the hanks are chained preparatory to bleaching.

A good many wick manufacturers make a specialty of "solutioning" or chemically preparing the plait for their customers. On the other hand, a number of large candle manufacturers carry out their "solutioning" themselves, and either purchase the plait grey or bleached from the manufacturer. It is a very satisfactory policy to allow the wick manufacturer to carry out the "solutioning" of the wick. If he is in the position to do this at all, he is generally equipped to carry it out efficiently and cheaply, decidedly more economically than an individual candle manufacturer can. An expert is usually in charge of this department who specializes in this peculiar branch of chemistry.

The general way in which a candle manufacturer obtains a wick to suit his candles is to submit to the wick manufacturer, either samples of the fat from which the candles are to be prepared, together with dimensions of the candles, or some of the candles themselves. If the latter are sent, it is convenient to the wick manufacturer if they are wickless. The chemist in charge of the department specializing in this "solutioning" then analyses the fat, to determine the constituents, if a blend of fats or waxes, and also some of the physical constants of the fat. He then sets about figuring the best "count" of plait to suit the diameter of the candle to be made. Next, the formula for the solution with which the wick must be treated has to be worked out. This often takes many days "cutting and trying" until the correct adjustment of chemicals has been obtained. There is no rule of thumb to go upon, each fat, or mixture of fats requires a specially adjusted solution, and this can only be arrived at by experiment. Samples are made using each trial solution, and tested for burning in the particular type of candles.

Grey Wicking.

This is used to a great extent, particularly in some localities. It is, of course, a little cheaper than the bleached wick, but my experience has been that the slight extra cost of the bleached wick is money very well expended. In fact, it could be figured economy to use bleached wick in place of the grey.

The grey wick contains all the foreign matter peculiar to cotton, natural oil and wax, resins, dirt, etc. These clog the fiber, and considerably break the capillarity. The result is invariably irregular burning of the candle, with sometimes more serious consequences. Also the plait is very much looser when grey, and this, in some candles, induces smoking, while in others is an advantage.

Some users of grey wicking give it a preparatory boiling with Ammonia or Soda Ash, to remove some of these impurities, and then give it the chemical treatment, but this is as costly a process as bleaching, and not nearly so satisfactory.

If the wick is "solutioned" without a preparatory treatment it is very difficult to obtain uniform addition of the chemical, and again, the result is irregular burning. I do not think there is any question of doubt that the bleached wicking is so superior to the grey as to be incomparable.

Bleached Wicking.

The bleaching process removes all of the impurities of the natural cotton, and shrinks the plait to a uniform degree of tightness. It greatly increases the capillarity, enabling the molten fat to flow uniformly up to the flame, and thus insures a regular burning result.

The application of the chemical solution is very much easier to the bleached wick. The absorption is regular and thorough, and again, uniformity is certain, if care is exercised in the treatment. I have noticed that a bleached wick will give a very much whiter flame than a grey wick.

Solutioning the Wicking.

The effect of "solutioning" is to retard combustion of the wick and to assist in causing the destruction of the ash formed.

The plant required for this process, and which would give a production of approximately 10,000 pounds weekly, would be:

Six 400 gallon lead-lined wood vats, equipped with open steam.

Two chemic machines for applying solution.
One centrifugal hydro-extractor with vulcanite basket.
Two rotary pumps.
One filter.
One drier.

The various solutions, would be prepared in the lead-lined tanks. They should be filtered and cooled before use in the chemic machine for application to the wicking. The wicking is thoroughly saturated with solution, and then transferred to the hydro-extractor for removal of excess solution.

This is a very important stage in the solutioning process. On the speed of the centrifuge, and the length of time the wicking is allowed to remain in motion, depends the amount of chemical which remains deposited in the wicking.

When the chemist calcu'ates the exact amount of the various chemicals required to be present in the wicking to give efficient burning results in definite types of candles, he has to prepare his solution, and calculate the length of time of extraction, to leave the required amounts in the plait.

An experiment was carried out by the author to determine the percentages of solution removed by a centrifuge traveling at 1,200 r.p.m. from saturated plait, for every minute of motion.

The results are tabulated as follows:

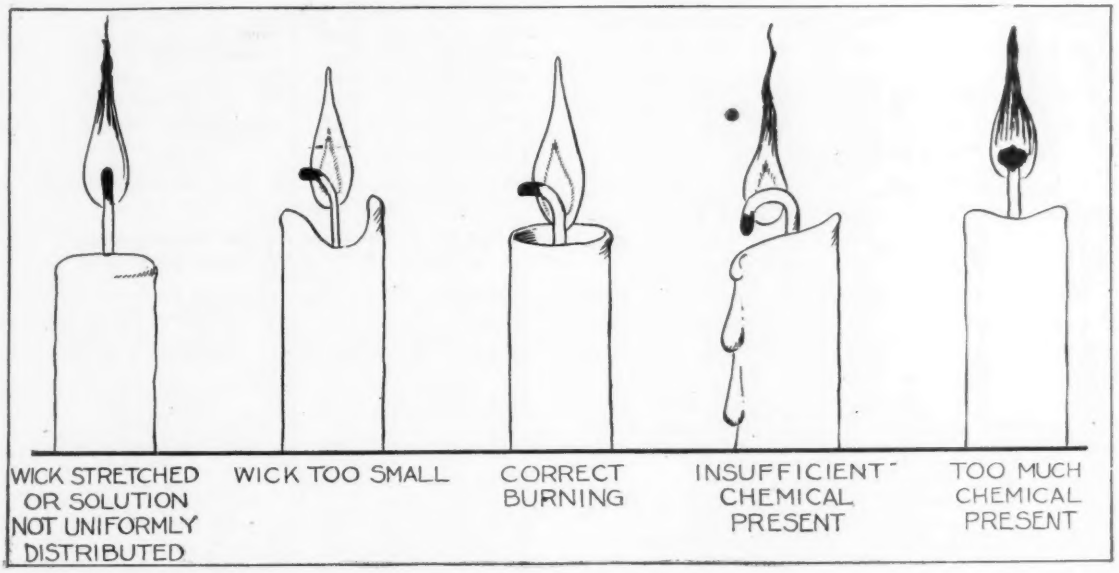
Wicking after saturation contained 82.23% solution.

Length of Extraction at 1,200 R.p.m.	Per Cent Solution Remaining in Plait
2 mins.	43.85
3 mins.	43.16
4 mins.	40.60
5 mins.	37.22
6 mins.	34.79
7 mins.	34.11
8 mins.	32.89
10 mins.	32.55
15 mins.	32.23

The extracted wicking then passes to the drier, and the excess moisture is removed. It is often difficult to dry this material uniformly as thick hanks of coarsely plaited wicks hold the moisture in the interior of the hanks very stubbornly, and while the exterior of the hanks may feel bone dry, and crisp, the interior may be very damp.

Great care must be taken here, as damp wicking causes a candle to splutter. The wicking is also laid open to damage by mildew, certain chemicals will often deposit crystals in the plait, and bad kinks can be formed on the spools. The wick should be dried bone dry always. If its moisture content is then below normal, it can be allowed to remain in a conditioning room, where it will attract the deficieney.

After solutioning, samples of the wick should be taken from various parts of the batch, and tested for burning in the particular type of candles for which it has been prepared. Wickless candles are useful for this test, as it saves considerable time which would have to be spent in moulding candles for the tests. The wick can be easily inserted in these wickless candles, and a rapid test made. The test should be carried out in a room protected from draughts.



When a candle, burned under these conditions, smokes, it indicates that the wick is too large. If the wick stands straight up, it has either been imperfectly extracted in the centrifuge, and solution has gravitated during drying to different portions of it, or by torsion it has been deprived of its elasticity.

A wick which bends too low, causing guttering, may be improved by raising the amount of chemical deposited in the wick, or strengthening the solution. Spluttering indicates wetness of wick. Dry wicking feels crisp to the hand. Mere dampness does not necessarily cause spluttering, but the dampness will considerably reduce its capillarity, and consequently the rate of consumption of the fuel is lowered, and therefore its illuminating power.

When a candle after having been blown out, continues to glow, and smoulder, burning down to a small stump above the wax, which is only lit again with great difficulty, the solution should be considerably strengthened. Borax and boric acid will provide the necessary vitality, while ammonium salts, such as the chlorides, sulphates, and phosphates, will assist in rendering the cotton fireproof. Potas-

sium salts also have a fireproofing effect, excepting in the outer envelope of the flame, which is intensely hot; here the carbon is destroyed, its ashes are fused into minute particles of glass by union of the salts present in the wick, and these particles are carried away by the strong air currents produced by the great heat.

A wick that has been badly stretched rarely burns well. It remains in the axis of the flame, and the lack of heat causes it to be unconsumed. Therefore the flame increases in size, and smoke is produced.

Too sudden bending of the wick throws the flame from its compact shape, the temperature is rapidly lowered, and the flame loses its intensity.

To pass as satisfactory, the candle should burn absolutely steadily, with no flickering or spluttering at any time. The wick should bend correctly, and combustion be complete, no ashes or particles being dropped in the cup of the candle. The flame should be clear, and should not smoke. No carbon must be deposited on the wick. There must be no guttering. When blown out, extinction must be instantaneous, and no smoking must follow.

If desired, an analysis can be made of the solutioned wicking to determine if the correct amount of chemical has been deposited.

Candle Power.

To determine the candle power of any particular candle, a Bunsen photometer can be used, the standard candle being one moulded from pure Spermacetti Wax, 7/8 inch diameter, and burning exactly 7.7 grammes per hour.

As previously stated, the size of plaited wick to use for a candle, depends on the diameter and also the composition. Some waxes require a coarser wick than others in candles of the same diameters.

The accompanying tables are the result of experiments to determine the sizes of plait required for candles of different diameters and composition.

30% TO 50% STEARINE CANDLES.

Size of Wick Necessary	Diameter of Candle
3/5 Plait. 24's Yarn	1/4 inch
3/6 Plait. 24's Yarn	5/16 inch
3/8 Plait. 24's Yarn	7/16 inch
3/9 Plait. 24's Yarn	1/2 inch
3/10 Plait. 24's Yarn	9/16 inch
3/12 Plait. 24's Yarn	11/16 inch
3/13 Plait. 24's Yarn	13/16 inch
3/14 Plait. 24's Yarn	7/8 inch
3/15 Plait. 24's Yarn	1 15/16 inch
3/16 Plait. 24's Yarn	1 inch
3/18 Plait. 24's Yarn	1 3/16 inch
3/20 Plait. 24's Yarn	1 5/16 inch
3/22 Plait. 24's Yarn	1 7/16 inch
3/24 Plait. 24's Yarn	1 9/16 inch
3/25 Plait. 24's Yarn	1 5/8 inch
3/26 Plait. 24's Yarn	1 3/4 inch
3/28 Plait. 24's Yarn	1 7/8 inch
3/30 Plait. 24's Yarn	2 inch
3/32 Plait. 24's Yarn	2 1/8 inch
3/33 Plait. 24's Yarn	2 1/4 inch
3/35 Plait. 24's Yarn	2 3/8 inch
3/36 Plait. 24's Yarn	2 5/8 inch
3/40 Plait. 24's Yarn	2 3/4 inch
3/45 Plait. 24's Yarn	3 inch

For use in Stearin or Stearin composition candles, the wicking should be plaited fairly tightly.

70% TO 100% STEARINE CANDLES.

Size of Wick Necessary	Diameter of Candle
3/5's Plait. 24's Yarn	1/4 inch
3/6's Plait. 24's Yarn	5/16 inch
3/8's Plait. 24's Yarn	7/16 inch
3/9's Plait. 24's Yarn	1/2 inch
3/10's Plait. 24's Yarn	9/16 inch
3/12's Plait. 24's Yarn	11/16 inch
3/13's Plait. 24's Yarn	3/4 inch
3/14's Plait. 24's Yarn	13/16 inch
3/15's Plait. 24's Yarn	7/8 inch
3/16's Plait. 24's Yarn	15/16 inch
3/18's Plait. 24's Yarn	1 inch
3/20's Plait. 24's Yarn	1 3/16 inch
3/22's Plait. 24's Yarn	1 1/4 inch
3/24's Plait. 24's Yarn	1 3/8 inch
3/25's Plait. 24's Yarn	1 7/16 inch
3/26's Plait. 24's Yarn	1 1/2 inch
3/28's Plait. 24's Yarn	1 9/16 inch
3/30's Plait. 24's Yarn	1 11/16 inch
3/32's Plait. 24's Yarn	1 13/16 inch
3/33's Plait. 24's Yarn	1 7/8 inch
3/35's Plait. 24's Yarn	1 15/16 inch
3/36's Plait. 24's Yarn	2 inch
3/38's Plait. 24's Yarn	2 1/8 inch
3/40's Plait. 24's Yarn	2 1/4 inch
3/45's Plait. 24's Yarn	2 1/2 inch
3/50's Plait. 24's Yarn	2 3/4 inch
3/55's Plait. 24's Yarn	3 inch
3/60's Plait. 24's Yarn	3 1/4 inch

For use in Stearin or Stearin composition candles, the wicking should be plaited fairly tightly.

PARAFFIN CANDLES.

Size of Wick Necessary	Diameter of Candle
3/5's Plait. 24's Yarn	3/8 inch
3/6's Plait. 24's Yarn	7/16 inch
3/8's Plait. 24's Yarn	5/8 inch
3/9's Plait. 24's Yarn	11/16 inch
3/10's Plait. 24's Yarn	3/4 inch
3/12's Plait. 24's Yarn	13/16 inch
3/13's Plait. 24's Yarn	15/16 inch
3/14's Plait. 24's Yarn	1 inch
3/15's Plait. 24's Yarn	1 1/16 inch
3/16's Plait. 24's Yarn	1 1/8 inch
3/18's Plait. 24's Yarn	1 3/16 inch
3/20's Plait. 24's Yarn	1 5/16 inch
3/22's Plait. 24's Yarn	1 5/8 lnch
3/24's Plait. 24's Yarn	1 13/16 inch
3/25's Plait. 24's Yarn	1 7/8 inch
3/26's Plait. 24's Yarn	1 15/16 nich
3/28's Plait. 24's Yarn	2 1/8 inch
3/30's Plait. 24's Yarn	2 3/8 inch
3/32's Plait. 24's Yarn	2 3/8 inch
3/33's Plait. 24's Yarn	2 1/2 inch
3/35's Plait. 24's Yarn	2 11/16 inch
3/36's Plait. 24's Yarn	2 3/4 inch
3/38's Plait. 24's Yarn	2 7/8 inch
3/40's Plait. 24's Yarn	3 inch
3/45's Plait. 24's Yarn	

Wicking for use in Paraffin Candles should be plaited extra loosely.

There are many different solutions which can be prepared for use with wicks for different candles. In most cases each solution is specially adjusted for each type of candle, but there are some "pickles" which can be almost relied upon as being satisfactory for certain definite kinds of waxes. Following are a few formulae which may be valuable information to some readers:

SOLUTION FOR WICKING DESTINED FOR USE IN PURE STEARINE CANDLES.

Ammonium Phosphate	10 lbs.
Ammonium Sulphate	30 lbs.
Boric Acid	5 lbs.
Water	500 lbs.

SOLUTION FOR WICKING FOR USE IN PURE TALLOW CANDLES.

Ammonium Phosphate	12 lbs.
Boric Acid	2 lbs.
Water	600 lbs.

SOLUTION FOR WICKING FOR USE IN 100% BEES' WAX CANDLES.

Ammonium Phosphate	24 lbs.
Ammonium Chloride	24 lbs.
Sodium Sulphate	30 lbs.
Borax	6 lbs.
Water	1,200 lbs.

SOLUTION FOR WICKING FOR USE IN 65% BEES' WAX CANDLES.

Ammonium Phosphate	20 lbs.
Borax	40 lbs.
Potassium Nitrate	8 lbs.
Ammonium Sulphate	2 lbs.
Water	1,200 lbs.

SOLUTION FOR WICKING FOR USE IN 25% BEES' WAX CANDLES.

Ammonium Chloride	28 lbs.
Ammonium Sulphate	24 lbs.
Boric Acid	24 lbs.
Potassium Nitrate	6 lbs.
Water	1,200 lbs.

25%, 50% AND 65% BEES' WAX CANDLES.

Size of Wick Necessary	Diameter of Candle
3/5's Plait. 24's Yarn	1/4 inch
3/6's Plait. 24's Yarn	5/16 inch
3/8's Plait. 24's Yarn	3/8 inch
3/9's Plait. 24's Yarn	7/16 inch
3/10's Plait. 24's Yarn	1/2 inch
3/12's Plait. 24's Yarn	5/8 inch
3/13's Plait. 24's Yarn	11/16 inch
3/14's Plait. 24's Yarn	3/4 inch
3/15's Plait. 24's Yarn	3/4 inch
3/16's Plait. 24's Yarn	13/16 inch
3/18's Plait. 24's Yarn	1 inch
3/20's Plait. 24's Yarn	1 1/8 inch
3/22's Plait. 24's Yarn	1 1/4 inch
3/24's Plait. 24's Yarn	1 3/8 inch
3/25's Plait. 24's Yarn	1 5/16 inch
3/26's Plait. 24's Yarn	1 7/16 inch
3/28's Plait. 24's Yarn	1 1/2 inch
3/30's Plait. 24's Yarn	1 9/16 inch
3/32's Plait. 24's Yarn	1 11/16 inch
3/33's Plait. 24's Yarn	1 3/4 inch
3/35's Plait. 24's Yarn	1 13/16 inch
3/36's Plait. 24's Yarn	1 15/16 nich
3/38's Plait. 24's Yarn	2 inch
3/40's Plait. 24's Yarn	2 1/4 inch
3/45's Plait. 24's Yarn	2 1/2 inch
3/50's Plait. 24's Yarn	2 3/4 inch
3/55's Plait. 24's Yarn	3 inch
3/60's Plait. 24's Yarn	

The manufacture of fine wicking for nightlights is in a way a similar proposition to the preparation of wicking for candles, though very much more delicate.

SOLUTION FOR WICKING FOR USE IN STEARINE AND PARAFFIN COMPOSITION CANDLES.

Ammonium Phosphate	12 lbs.
Ammonium Sulphate	36 lbs.
Borax	15 lbs.
Water	600 lbs.

SOLUTION FOR WICKING FOR USE IN PURE PARAFFIN CANDLES.

Potassium Chlorate	2 lbs.
Oxalic Acid	2 lbs.
Boric Acid	8 lbs.
Ammonium Sulphate	19 lbs.
Water	1,200 lbs.

The Mossberg Pressed Steel Corporation, of Attleboro, Mass., is devoting its equipment exclusively to the production of sheet metal products, it is announced, and is featuring pressed steel spools, reels, beam heads and beams for the textile and wire industries. Its general manager, Frank Mossberg, who is also president of the company, is such a

Frank Mossberg.

firm believer in the future of pressed steel as the answer to many problems involved in the manufacturing and transportation ends of these two great industries that he holds his organization strictly to this type of work.

"I want everyone in our factory to know pressed steel," said Mr. Mossberg recently. "I want everyone to have a good general knowledge of it, but I want our people to be pressed steel experts when they come in contact with the textile and wire industries. That's one reason why I never was more proud of my output than at the present time. Our principle of concentration on these two great industries, has made our Mossberg men able to 'engineer' the spool, reel and beam problems of our customers as well as to offer a line that performs well in relation to its cost as to make it beyond question the economical line for the cotton, woolen or wire man to buy and use."

Mr. Mossberg organized the Mossberg Pressed Steel Corporation in 1919. Mr. Mossberg first designed, patented and began to manufacture pressed steel spools and reels in 1904 and has given his constant and close attention to the betterment of these and allied products ever since.

Carding Discussion Held at Greenwood, S. C.

A somewhat diminished attendance did not detract from the interest of the meeting held by the Carding Division of the Southern Textile Association in Greenwood, S. C., on Friday, December 12th, nor did it affect the character of the discussion.

Marshall Dilling, now president of the Association, swung back into working harness as discussion chairman at this meeting, owing to the unavoidable absence of Chairman J. O. Corn, of Columbia, S. C. Mr. Dilling, thoroughly familiar with handling the meeting through his long experience in the position now held by Mr. Corn, added much to the discussion; he was assisted in conducting the meeting by S. G. Touchstone, overseer of carding, Granby plant, Pacific Mills, Columbia, S. C.

Comparisons between local and western cotton occupied a large portion of the discussion program as outlined in the questionnaire, though quite naturally the trend of talk was directed away from this specific point several times during the day.

The morning session was opened by Mr. Dilling at 10 o'clock, in the court room of the Greenwood County courthouse. Secretary Barnes, of the local Chamber of Commerce, welcomed the visitors in a brief talk, Mr. Dilling responding on behalf of the mill men.

The first question brought up for discussion was the percentage of moisture found in cotton. Mr. Dilling, reporting for himself, said that on Mississippi cotton to be made into combed yarns at his plant the A. M. Smyre Mfg. Co., Gastonia, N. C., "we made three tests from the outside of the bale, and in these bales we found 9.03 per cent, 9.11 per cent, and 9.10 per cent, an average of 9.08 per cent; and then from the inside of the bales we found 8.94 per cent, 9.02 per cent, and 8.71 per cent, giving an average of 8.89 per cent; and for the whole bales, an average of 9 per cent of moisture. This was taken out of the bale and was dried bone-dry, giving just the exact amount of moisture in there."

Mr. Touchstone, of Columbia, next reported, saying in explanation that, "the figures I have were secured from the Cotton Research Company, at Boston. The cotton was sent from the Granby plant at Columbia. The report on western, 1-inch cotton, on the inside of the bale, was 8.22 per cent moisture; on the outside, 8 per cent—giving an average of 8.1 per cent. On the local cotton, 15/16-inch, grown in South Carolina, on the inside of the bale the average was 9.3 per cent, and on the outside it was 8.4 per cent, an average of 8.85 per cent. Since that time we took a number of samples and sent them up to be tested but unfortunately that report has not been returned.

"It seems to me that just at this time it would probably be well to ask a question that might be answered by some of the gentlemen here; it occurred to me a few days ago. In opening cotton in the opener room, with the room exposed—say we have doors north and south, with a current of air and it is practically impossible to keep the opener room closed—and the cotton lies in the room ready to go into the hopper, or vertical opener, or whatever we might put it into. We have a short distance to go there. In the winter-time, we have a temperature there of say down around 33 or 45, or even freezing. That cotton goes very quickly into a temperature of 70 to 80 degrees. What effect does it have on the cotton to pass from this cold, clammy atmosphere and into this heated atmosphere so quickly? I have an idea that it will be something like the effect on a piece of glass or other substance under similar conditions—that it will create a 'sweat.' I noticed the breaker laps in just that kind of weather—doubtless you too have noticed it—the breaker laps will seem more condensed. The cotton will feel damp and clammy. There is something between the opener room and the breaker that affects the cotton; you don't have it in dry weather, either cold or warm, but you do get it in very damp weather."

Referring to the samples forwarded by Mr. Touchstone, to Boston, Mr. Dilling asked how these were sent. "We sealed them, immediately after pulling them from the bale, in an ordinary fruit jar, with good rubbers, so they retained whatever moisture there was in the bale."

At this point H. H. Willis, of the Bureau of Agricultural Economics, with testing experiment station at Clemson College, S. C., pointed out the importance of taking the temperature of the room to be used in connection with the test; then, he explained, it doesn't matter what changes may occur, just so this is a matter of record to begin with. He called on W. G. Blair, formerly connected with the department, who stated further the importance of taking the samples immediately upon the receipt of the cotton at the mill. Mr. Touchstone said that his samples were taken from the cotton in the opener room, and Mr. Blair then explained that this cotton had had time to assume the atmospheric conditions of the warehouse in which it was stored, and thus the samples did not correctly represent the amount of moisture in the bales at the time of their receipt at the mill.

On a trip to Arizona some time ago, Mr. Blair continued, he was told that the first shipment of cotton from that section went to Boston by water, and that in transit this cotton gained enough, in moisture, to pay the carrying charges from Phoenix, Arizona, to Boston, Massachusetts. Other tests showed that cotton stored over the bay in Fall River, said Mr. Blair, contained as much as 10 to 11 per cent of moisture. "The condition under which the cotton is stored has lots to do with it," he continued. "If you store it on a cement floor on the ground floor you will have more moisture in it than if stored on a wooden floor or upstairs. The cement seems to hold moisture longer.

"Mr. Touchstone mentioned about what takes place between the opener room and the breaker," said Mr. Blair, "and right along this line, if you were running a Middling cotton, and let it go through at a temperature of between 110 and 130 degrees, you would find you would have an exceptionally clean cotton. In other words, by raising the temperature of that cotton to 110 to 130 degrees, the trash and foreign matter is more easily removed from the fiber than it is at the normal opening room temperature where you have a high humidity because you are getting the outside atmosphere, and because it is a varying temperature."

"That seems to partly answer my question," said Mr. Touchstone. "He states it will give us better results, and it will be easier to remove the foreign matter from the cotton, if we dry it out." But Mr. Blair emphasized that

(*Continued on page* 295.)

Sulphate of Magnesium and Kieserite

BY JOHN BROADBENT.

I am going to treat of the native sodiums, Kieserite and its analogues here, and of their uses and abuses in the region of finishing and I would say that I have used many tons of each in the line which I have more or less fluently mapped out, and I want, while I am on the subject, to point out that a large if not the whole number of our finishing materials come or grow out of the ground.

Magnesium is made from Kieserite. Kieserite is dug from the ground and is composed of a mixture of sulphate of potash, soda and magnesia. It is worked chiefly for its potash salt, which is by far its most valuable constituent and we have used it both as Kieserite and Epsom Salts.

It is easy to divide the finishing agents into two divisions, i.e., to say they may be so subdivided into two subdivisions. The Kieserites and Epsom Salts come under the head of stiffening and weighting agents and with epsom salts, Glauber's salt, etc., we shall so classify them in the present paper.

Kieserite, epsom salts, Glauber's salt, common salt, etc., are used with two objects in finishing. The first object is to stiffen the cloth and make it feel firmer, and in the second place, to give weight to the cloth. They do this, and this is why they are valuable in this connection, they act without destroying or altering the face of the fabric or making it look chalky or dull as opaque finishing factors such as clay, etc., this they do by acting as a thoroughly crystaline body that is more or less of a transparent character.

In this way they are largely used in the finishing of prints and similar goods where the color is of considerable importance and where the color must be kept in full bloom without the use of opaque finishes.

Kieserite is a by-product prepared during the process of refining the salts of potassium found at Stassfurt in Germany. It is usually made into large blocks having various colors. The following analysis (2 styles) will give its ordinary composition:

	No. 1	No. 2
Magenium Sulphate $Mg.SO_4$	45.47	41.86
Insoluble matter	14.57	10.37
Water H_2O	34.99	33.93
Magnesium Chloride $Mg Cl_2$	2.70	3.60
Sodium Chloride Na Cl	1.25	2.75
Sodium Sulphide Na SO_4	1.02	7.35
	100.00	99.86

Kieserite is usually sold as containing 46 per cent of sulphate of magnesia; it is used as the raw material for making finishes or for making epsom salts. Finishers prefer, however, to use the alum epsom salts, for unless great care is taken the dirt and grit, which is to some extent insoluble, is quite likely to dirty up the cloths when boiled with them.

The cleaned extract, or, the Kieserite itself is used in finishing, sometimes as a stiffener and sometimes to merely give weight to the cloth or yarn to be finished; it is a great weighting agent and a cut of goods 75 yards long can be weighted up 6 or 7 pounds. Of course the weighting depends entirely on the strength of the magnesium salts through which it has to pass; thus 60 degrees Tw. will give about 6 lbs., one of 26 degrees Tw. will give about 2 pounds; one of 55 gallons of liquor may be produced by 25 pounds of Kieserite producing liquor of 60 degrees to 62 degrees Tw.

Its solubility in water is what gives the epsom salts its great weighting properties. It penetrates easily the interstices of the cloth to the fibers of which it is applied; it crystallizes on drying and causes the fibers to expand and grow larger and in this way imparts to the goods a substantial feel. As long as it is perfectly natural it has no deleterious action upon any of the cotton colors and may be used on any kind of fabric-prints, whites or any kind of self-colored cloth or yarn. There is little or no liability to mildew when finished with epsom salts and we have yet to hear of the first case of this happening with a salts finish.

It is quite possible that damages may happen with epsom salts (i.e., Kieserite or Epsom Salts) finish. If we take a solution of epsom salts and dip a piece of cloth in it and then dry it, and then dip it in water, and dry it again and repeat for three operations the cloth will be found to be tender. A multitude of these operations will have crystallized repeatedly the epsom salts of the Kieserite occurring on the finished fiber and these disintegrate it and the continued motion of this finish will have caused the cloth or yarn to become tender and rotten. Now with epsom salts, if pure, this is not likely to happen of itself; but if a deliquescent salt such as magnesium chloride or a zinc chloride is also present and mixed with the epsom salt and alternate damping and drying is given to the cloth (or yarn), and this is quite likely to happen, the goods whether cloth or yarn are liable to become rotten.

The cloth or yarn *finished* with epsom salts is dangerous of itself without the added danger of chloride of magnesium, the question of danger from the use of epsom salts in conjunction with chloride of magnesium is one which is brought continually forward, and while we agree with the conclusion in the particular case of Oxford shirtings, etc., we do not agree with the statement that "this action could only take place where the goods were heavily weighted with epsom salts, and contained a considerable proportion of the chloride." Practical experience points to the opposite, and shows that where a large proportion of chloride of magnesium is present, sulphate of magnesium does not tender the cloth. It is common knowledge that large quantities of epsom salts are used regularly in connection with chloride of magnesium in sizing and that no damage was ever known to occur. The following mixing has been used for many years without tendering taking place, and it is well known to the author:

Flour	2950 lbs.
China Clay	1322 lbs.
Tallow	324 lbs.
Epsom Salts	560 lbs.
Chloride of Magnesium, 54 gals. at 60 deg. Tw.	
Chloride of Zinc	25 gals. at 102 deg. Tw.

It will be seen that so large a relative proportion as 30 per cent of chloride of magnesium to 70 per cent of Epsom Salts may be used without ill effects resulting.

It is the opinion of the writer that the danger from magnesium chloride is when it is present in epsom salts in small quantities as an impurity and never in large quantities when it is used in sizing, especially where chloride of zinc is present in large lots as a powerful deliquescent. The damage is due to the small proportion of chloride of magnesium present. This would allow the epsom salts to crystallize under certain atmospheric conditions, and redissolve under others, whereas, in sizing, where a large proportion of chloride of magnesium is present, the yarns are kept in a moist condition (a condition not desired in finished goods).

In spite of the theory of the cause of damage in the above mentioned case, it is a matter of fact that large quantities of flannelette, shoe linings, etc., are "finished" with epsom salts in conjunction with chloride of magnesium and glucose and the writer has never come across a case of damage that could be attributed to this cause. The principal risk from the presence of chloride of magnesium in "finished" goods is, that during the drying process, the chloride of magnesium may be decomposed with the formation of hydrochloric acid. This would of course tender the fabric. There is more danger from this cause in finishing than there is in sizing. The reason for this is twofold. In the first place "finished" goods have, as a rule, been bleached, and this renders them more susceptible to the action of free acid than gray yarn which has not lost its protective coating of waxy and oily substances. In the second place the drying operations in "finishing" are very different to the drying operations of sizing.

Sulphate of magnesium is one of the important sulphate bodies akin to epsom salts that is brought into the use of the finisher. It is found in small quantities in certain natural springs, usually those near Epsom, from which it derives its name. It is also manufactured and is also found in certain deposits at Strassfurt, Germany. It is noted from its being formed of sulphate and water only, and in its purest form it contains:

Magnesium Oxide Mg O.....	16.26 lbs.
Sulphur Trioxide S O_3.....	32.52 lbs.
Water H_2O	51.12 lbs.
	100.00 lbs.

or:—

Magnesium Mg	9.83 lbs.
Oxygen O	26.23 lbs.
Sulphur S	13.12 lbs.
Water H_2O	51.22 lbs.
	100.40 lbs.

Sulphate of Magnesium is a salt used by the finisher in both the form of epsom salts of a more or less pure quality and the impure (56 per cent) Kieserite.

Epsom salts was made at one time by the dissolution of the natural carbonite in sulphuric acid solution. The magnesite, etc., was dissolved in sulphuric solution and crystalized out in the form of salts—epsom salts, Magnesium Sulphate, crystalizes in the form of small silky needles, i.e., they are transparent prisms which are soluble in their own weight of water. When exposed to the air they are effloresent; their surface when pure, becomes coated with anhydrous sulphate, they give off seven molecules of water of crystallization by heating, but they make no other change. Impurities of one sort or another are usually found among the epsom salts furnished to finishers although they look all right and finish all right; the usual impurities found are magnesium chloride, potash and soda salts, and insoluble matter.

It is important not to mix calcium chloride with epsom salts, in such case a chemical decomposition sets in resulting in the formation of calcium sulphate, which, being deposited on the fiber, has a tendering effect upon it.

When testing epsom salts it is fully desirous of finding out the exact amount of sulphate of magnesium (which is the body looked for) it contains and also a qualitative or quantitive estimation of the chloride of magnesium which may be present.

For finishing with epsom salts would say that for woven or colored dress goods for export the goods are finished by simply mangling through epsom salts at 40 degrees Tw., on a two-bowled stiffening mangle and drying over tins.

Sulphate of soda can also be used along with epsom salts. The stiffness of a salts finish may be also regulated after passing through the stiffening mangle by the mode of drying. A slow drying on the cans with a steam pressure of 10 pounds makes a stiff finish, by running the cloth quicker, a softer feel can be given. A nice soft finish can be given by using epsom salts at 40 degrees Tw., with a small addition of chloride of zinc, and drying in the stove or dry room.

Plain or salts finish are given to all kinds of white, printed or fancy cloths for the market. These are very simply produced by either epsom salts or Kieserite, in the former case the salts are boiled up with water until they are 40 degrees Tw., while hot and the Kieserite is boiled up to 50 degrees Tw., then the liquor is run into the liquor box, and the cloths passed through and then dried upon the cans. This gives a nice finish, having a crisp full feel.

Epsom salts is a good filling material. It is very soluble in water, and therefore it is readily taken in by the fiber, in this manner it gives the goods a very substantial feel. It is, however, not a very good finishing material to use in conjunction with starch as it creates (with other substances) dusty mixings. This condition of affairs is caused by the action of the epsom salts on the starch which it tends to curdle.

Proof that they intend to produce new finishing machinery as well as act as a repair base for southern textile plants was evidenced recently, when the first southern-made husk calender roll was shipped from the Greenville, S. C., plant of H. W. Butterworth & Sons Company. The plant has been in operation less than a year. The first husk roll turned out at the southern branch had all the same characteristics and did not differ in any respect for the rolls regularly produced by the main plant of the Butterworth company in Philadelphia. Making this and similar types of rolls will be a part of the regular operation of the Butterworth southern plant, it is announced.

Human Relationships in Industry

BY W. M. McLAURINE.

Suggestions.

There are a few people in life who know everything. There is nothing that can be told to them. They either know all about it already, or it is not worth knowing. This attitude is generally characteristic of the beginner, or the man on his first job, or the man who has been on the job for a long time. The man on his first job glorifies and exults in his enthusiasm and supposed complete knowledge of all details. The man who has been on the job for a long time has grown blase and dropped into the rut of automatization and refuses to come up. Both of these types resent suggestions. They resent interference, as they term it. I like a doctor that knows a lot, but I am afraid of one that knows it all. The body is too complex and disease is too varied in its form and attack for the small head of one man to contain all the information necessary.

The All of yesterday, is often insufficient for today. The Creator, in his wisdom, did not place all knowledge worth while in one mind. He placed it within the grasp of the minds of men, but men, because of their peculiarities, eccentricities and natural aptitudes select here and there according to their seeming desires and necessities. One mind may seemingly have a corner on the market, but the steady grind of daily demand will reveal a deficiency somewhere, at some time. Brains and abilities are varied and scattered throughout the human race. Even in the same class they are varied and scattered. Although a man may be president, superintendent, or overseer, this fact does not indicate that he is incapable of error in any of these positions, or that he knows every detail of his job without advice, counsel or suggestions.

The wise leader knows this fact. Hence, he is open-minded and ready to receive constructive suggestions from whatever source they can be secured. If it is necessary to set up objectives for this conference, the following may be considered:

1. To enable the group to recognize and appreciate the value of suggestions.
2. To outline or set up a suggestion system.

Under the discussion of "Incentives, or Maintaining Interest on the Job," one factor developed was ambition, another, self-respect, another was respect for the overseer. It seems to me that a system of suggestion offered by the employees of an organization would assist in putting all of these incentives into operation.

The man who is ambitious is always alert and studying his job. The operation or execution of any job is not perfect, hence this ambitious employee is likely to learn something of value about his department or his job. In order for him to remain ambitious he must have some avenue of expression. I know of no better way than through suggestions. It may not always be feasible or practicable at that particular time, or under the existing conditions to put into operation, but the employee must feel that here is a way in which, or through which he may project his idea. This fact will be a great factor in increasing his self-respect or to reverse it, respect for self. Many people who work in the daily deadening grind of monotony grow stale, unless some invigorating agency spurs them on. They grow dull and listless and arrive at a treadmill attitude toward their work. They lose respect for themselves and their associates. They feel that they are only machines, and brains are useless. The mill management is not interested in their industrial welfare, only as it is of value to them. They begin to die with the "dry rot." A man must respect himself before others will respect him properly, and before he can properly respect others.

We like for our brains to be respected. I know of no greater way that an overseer can win the confidence of his employees and hold it, than through a sane, safe, suggestion system. At once, the group begins to feel that they are partners in the organization and they must look out for other interests besides their own. They are no longer order takers, and task dischargers, they are pace makers and brain workers in industrial progress. Increased cooperation is the result. I have met two classes of overseers in my work in the mills. An overseer said to me one day, "I never speak to my employees about anything except business, I do not allow them to speak to me unless necessity requires it. I will not grow familiar with them, nor allow them to become familiar with me." I wondered how much respect the help had for this man. I wondered how many suggestions the help made to him. I wondered how alert and ambitious his help was. I wondered if his splendid system of management, as he termed it, was not a system in which the "fear factor" was dominant.

There is a kind of familiarity that is dangerous. We often reveal our true selves when we are familiar and often when people find out what we really are, they lose respect for us. This must not necessarily be the case. If overseer or executive is a real leader, he need have no fear of revealing his true self. In fact, he can not be a real leader and not reveal himself.

Familiarity on constructive lines is always safe. Familiarity on destructive lines is never safe. To state this fact illustratively, I would not hesitate to discuss in detail an employee's job with him and listen attentively to his suggestions. I would not hesitate to visit him when he is sick. I would not hesitate to sympathize with him in his troubles, but I would hesitate to take a drink with him, or to go to questionable places and do questionable things.

I went through a mill with another man and he carried me from place to place and showed me improvements that had been made from suggestions of the operatives. Often he introduced me to the individuals and explained how valuable the suggestions were. This man was the idol of his employees.

In another mill in which I was not conducting conference work, I was invited to attend a meeting of the operative executives to observe their subject matter and discussions. I was delighted. The entire meeting was taken up in discussing suggestions. The leader had called for these the week before and they had been placed in a box with the "suggestors" names on them. They were read with names omitted and the group then discussed their value, their practicability, and all other phases that seemed to

require attention. No personalities were mentioned, only the economic and industrial values were considered. As each suggestion was discussed it was numbered. At the end of the period, the group voted on the 1st, 2nd and 3rd choice. The names of the persons who made the suggestions were then made known and rewards were given. It was one of the finest fellowship meetings I ever attended, and many valuable suggestions were made.

I went through the mill; I talked to the operatives; I watched them as they worked. The mill was alive; the people were alive; the mill was efficiently productive; the people were happy.

1. What do you think of suggestions? Have you ever tried them?
2. What method did you use? Could it be improved?
3. What methods are used by other mills?
4. How should suggestions be handled?
   a. Those undesirable.
   b. Practicable, but not desirable under present conditions.
   c. Desirable.
5. Do you encourage suggestions or simply consider those that happen in?
6. Should there be rewards for suggestions?
7. What dangers may arise from a suggestion system?
8. What do you think the attitude of the operatives is or would be toward such a system?
9. Would you limit the scope of suggestions to be made, or accept suggestions on anything in the mill or village?
10. What kind of person should be Chairman of a suggestion conference meeting?
11. Have each member of the group recall some suggestion he could have made or did make when he was an operative and the attitude of the overseer toward it.
12. Have each member of the group indicate some suggestion that an operative made to him or attempted to make, and his attitude toward it.
13. Have each member of the group to indicate some condition or operation that is not entirely satisfactory and discuss whether or not it would be advisable to have the help offer suggestions for its remedy.

A caution should be made here, and it should be considered as a fundamental factor in all conferences.

Only suggestions that lie within the realm of the overseers and operatives to be remedied by them should be made or discussed. It is futile and dangerous to inject or allow to be injected subjects that lie without their jurisdiction.

In discussing the second objective, it might be well for the group to outline a list of subjects indicating needed improvements in the daily mill life. Below are some suggestions that may indicate the type of work I have in mind. They may be good or bad, according to the attitude of the group and local mill condition. They are by no means complete or intended for any use, other than example.

1. Accidents—cause.
2. Tardiness.
3. Absenteeism.
4. Waste.
5. Processes.
6. Routing of material.
7. Arrangement of machinery.
8. Village conditions, etc.

In putting into operation a suggestion system, great care must be used in order that reactions may not be unfavorable. Jealousies may arise because of the fact that one suggestion may be accepted and another one rejected. Egotism or swell-head may arise because some operative has one or more of his suggestions accepted. Indifference on the part of some may result from not having their suggestions put into action.

It requires diplomacy and leadership to do this work, but it is worth while.

If the leader and the group decide that it is a project worth while, the plans and operations will of necessity be worked out by them.

It occurs to me, that in the making of the plans the following factors should be embodied.

1. Subject matter on which suggestions are desired.
2. Method of gathering or collecting suggestions.
3. Time for making and collecting suggestions.
4. From whom suggestions are desired.
5. Committee or group that shall discuss suggestions.
6. Record or reports to be made of suggestions considered.
7. Reward or recognition for good suggestions.

Each suggestion should be made in good faith and signed by the person who offers it.

They should make only constructive suggestions which should be free from personalities, animosities or petty jealousies.

Any suggestions that may contain such should be rejected for discussion before the group, but referred to the party so involved for a private, friendly consideration for adjustment.

It might not be amiss to have all parties who make suggestions attend the meeting to hear their suggestions discussed.

A general characteristic of the group should be that of welcoming a new idea and not afraid of anything that means greater good for a group or the factory in general. Open-mindedness must be always present.

"For want of a nail, a shoe was lost; for want of a shoe, a horse was lost; for want of a horse, a rider was lost; for want of a rider, a battle was lost."

There are many nails, which are needed in our daily industrial life, that are lost or seemingly not needed until too much time has passed. I believe, in a wisely conducted system of suggestions, many nails can be found that will fit and fasten the shoe in the place where it is needed.

Let the group now proceed to definite details of their system.

A booklet on metalwood panels, Haskins "Armord" trucks, mill boxes and bench tops has been issued by R. G. Haskins Company, 520 West Monroe St., Chicago, Ill., who manufacture these products. It is known as catalog No. 24, and illustrates and describes the various products mentioned.

The National Association of Hosiery & Underwear Manufacturers has mailed to members its "Knit Goods Jobber Credit Information Book," which contains 48 pages, listing credit information regarding about 2,400 jobbers of hosiery and underwear. It is planned to keep the lists up to date, and an enlarged revised edition will be issued later.

Measuring and Recording Color

BY HIBBARD S. BUSBY
RESEARCH COLORIST.

Considerable interest has been aroused recently in the subject of means to measure very accurately, record, and specify color in numerical units.

For the textile man, colorimetric studies are merely one step (though a vital one) in an important larger structure of specuation upon which all determination and evaluation of finish and quality is based. However, the means to "measure" color are a branch of the larger science of physical measurement upon which all accurate specification of durability depends. It is therefore timely to determine the relative importance of all those factors which form the selection-basis for any fabric, whether we be concerned with the choice of the ultimate consumer or the judgment of the quality inspector who passes upon its rating as a salable article.

Recently a cotton expert stated as his positive knowledge that the ability of a certain mill to produce and maintain its white cloth at a grade of white several "shades" whiter than previously had *alone* resulted in this cloth being rated as three steps higher in the scale of *quality*, which determined its selling value.

More particularly, the recently expressed trend of thought of the American Cotton Manufacturers' Association toward the production of a larger percentage of finished, dyed and printed goods makes this subject one to which the future producer of decorated fabrics should give his attention. A large part of the trouble that has been encountered in stabilizing the market for finished textiles has been due to a lack of confidence which the consumer has come to have in their quality.

It seems axiomatic that the better class of designs have, in the past, been produced on materials of the highest degree of perfection which their makers could produce—it would be extremely unfortunate if the vision of the manufacturer, who is to supply the best of next season's goods, should be so limited as to think he could hope to compete, eventually, with even the best designs on a goods background of inferior quality or with grades of color and finish that are not comparable with the vast progress which the art has produced.

The record for high-grade output conceded to the southern manufacturer of cotton for many years gives assurance that his finished goods will be, at least, as fine as his whites. To that end it is timely to point out that so far has the art of process-control and measurement of the appearance-characteristics of materials been developed that it is now possible to check up, or measure, record, and specify, such matters as sheen, degree of white or black, accuracy and nature of color, smoothness of surface, and harmony of color combination—the whole with an accuracy and repeatability that removes the competition of timeworn methods of guesswork and rule-of-thumb.

The researches which have made this possible are now in so far advanced a stage of their application that instruments have been constructed by which it is possible to do, reliably, the things mentioned above, and many other details of process-control besides. Indeed the work has been perfected to a stage that makes archaic any excuses for inability to register (with a view to repetition) these factors above-mentioned although the excuses are still frequently met with in published "standards."

Optical, photographic, photometric and colormetric means have been deliberately advanced to a refinement beyond the power of the normal eye to equal—which has the practical advantage in that when the range of error, so controlled, is within the ability of the eye to detect, it is possible to eliminate the cause of defective goods at their point of origin. Discovery of roughness and bad quality in yarn immediately at the operation where it is first (microscopically) visible has been the means of revising and correcting defective process and extensive loss.

In the micrographic study of raw fiber and sized cloth a number of quality defects first make their appearance, giving sufficient warning to save wastage in later, concealing processes, and materially reducing the number of pieces that must be converted (to salvage them) into "blacks."

More particularly, the producer of white goods can gain the advantage of a standard, to which he can align production, by recording, in accurate detail, the elements of the yarn and cloth which he must duplicate or better in quality, and in addition to this he can derive, from the laboratory "tools" now available to him, detailed analysis and information on conditions of his product that have been merely matters of speculation since the beginning of textile-craft.

In a brief article of this sort it is impossible to do more than merely mention some of the more noticeable opportunities for assisting in raising standards of manufactured quality—to the manufacturer who is interested in the possibilities of this science and what it has already done it is recommended that several lines of work be investigated:

A. For mills producing uncolored yarns and cloths only. Standardization of "white" and measurement of same. Photographic recording of (1) yarn size, (2) yarn quality, (3) evenness of twist, (4) evenness of weave, (5) fuzziness of yarn, (6) the nature and cause of yarn breakage.

Detection of quality and nature of "dirtiness" in yarns, cloths, washes, sizing, solutions, etc.

Determination of fiber defects and their nature.

Standardization (and recording) of fiber characteristics.

B. For mills producing plain colors, prints, and jacquard woven effects.

Determination and measure of "dyeing-power" of a dye.

Standardization with regard to fastness to light, etc.

Accurate registration of colors (without keeping samples).

Reproduction, over long periods of time, of same (printed) colors.

Creation and determination of color harmonies, and means to repeat in the printed (or woven) color effect the exact harmony (color effect for color effect) of the artist's sketch.

Back-Filling Bleached Goods in India

BY H. R. BAND.

Finishers accustomed to the finer counts and regular weaving of the Lancashire woven goods, find a great difficulty in satisfying themselves with their results when they have to handle the coarser product of the Indian looms.

Fortunately the market they cater for is not so exacting as, say, the Manchester market. Nevertheless, the finisher is never free from many distracting factors that are likely to raise his temperature even in the steamy atmosphere of a city like Bombay. Some of these are climatic and are unavoidable; others are human, and one might say, they also, are unavoidable.

One of the former is the difference between the atmospheric conditions of the dry season and the monsoon. A finished piece which retains a soft mellow handle at the end of the hot season will resemble a wet rag during the rains, and a piece, mellow to the handle during this season of rains, will become like a board when the brazen sun once more glares down from a cloudless sky.

Another circumstance that does not always help the finisher, is that he may not be aware of the destination of the goods which he has finished. Certain lines may be shipped; others sent up into the dry plains of Central India. Then they may be delivered during the monsoon period, and others kept in stock until the following dry season.

Heavily filled goods as a rule, improve in feel after baling and storing.

The human factors that are so worrying at times, are not confined solely to India. . . . I refer to buyers and salesmen. There are those who can tell a good finish, and those who cannot. Others know what they want, but their ideas are at variance with those of the finisher. The request will sometimes come for a finish like the one that such and such a mill is putting on the bazaar. It may happen that this particular firm is weaving a superior cloth to the one which you are finishing.

Varying climatic conditions supply a ready handle for the haggling buyer, or for a merchant who is seeking some excuse to escape from a binding contract during a falling market.

The number of complaints are a kind of barometer, indicating the state of a particular market. The gentleman who worries the finisher the most is the buyer who always condemns the finish, thereby hoping to obtain some reduction in rates. This condition is not so bad with a master who thoroughly understands his business, but in India there are masters to whom their mill is but a sideline. They have some controlling interest in a bank, are interested in the Stock Exchange, or are more interested in preparing a brilliant speech for the Legislative Council than in worrying about works details.

These difficulties apply exclusively to heavily filled goods. With slightly assisted cloths and those finished pure, there is seldom a complaint about the finish; the buyer and salesman generally direct their complaints to the weaving master regarding these goods.

It is surprising what strange finishes have a run in the bazaar from time to time. An instance came under the writer's notice of a sample piece supplied for finish and white. It was a woven striped shirting. The strip was blue and had been dyed with one of the vat colors. During the bleaching the color had run, imparting a slaty blue ground to the piece.

This particular tone of "white" was wanted by the merchant. If it is discovered that the finisher is a fairly good hand at putting a back on cloth, his powers in this direction will be put to the test; the percentage of cotton will decrease and the filling increase. A finisher can go only so far in this direction, or his reputation will suffer. A merchant who knows his business will take up a heavily filled piece in his hands and bang it on the table, or he will grip it a few inches inside with his thumb and finger and pull. If the piece dusts or china clay comes off on to his fingers, he will pull a wry face.

The writer did a considerable amount of heavy back-filling in India, chiefly woven colored striped shirtings, and the back-filling machine used consisted of a large cotton bowl, fitted with a lint doctor in front and a cleaning doctor behind. The cloth passes over rails to give it the desired tension and passes face inwards round the bowl, entering the machine immediately below the lint doctor. Behind the machine it passes under the cleaning doctor, over a brush roller and on to the plaiting-down motion. The goods are dried on a drying machine specially designed for back-fill goods. The first two cylinders are six feet in diameter and over these the goods pass with face to the cylinders. After cooling, the pieces are damped and stretched, and ultimately calendered.

On this machine a variety of finishes can be produced. In back-filling striped shirtings the finished weight averaged about 20 per cent above the grey weight. With low quality goods up to 60 per cent above the grey weight has been put on by the writer, but in this case a preliminary skimming was resorted to.

The average width of the cloths finished were such that two ends could be run, side by side, thus increasing the production.

The ingredients which the writer found suitable for all but specialties were: china clay, starches, Turkey red oil, mercine glaze and resin size.

A finishing blue which gave satisfactory results was Edge's tinting blue (green shade). A red shade was also necessary for toning. The china clay should be worked up in a separate tub fitted with agitators. All the ingredients should be reduced with water, and sieved into the mixing tub (in heavy mixings very little is allowable). Open steam is best for heavy mixings, as the agitation is more vigorous.

The following is an average heavy mixing:

75 lb. corn starch.
30 lb. farina.
10 lb. tapioca.
18 buckets china clay (4 lb. per gallon).
1 gallon mercine glaze.
2 gallons turkey red oil.
1 gallon resin size.

(*Continued on page* 283.)

Is depreciation a convenience or a fact?

Twenty years ago the term depreciation was little understood in business. Today it enters into every calculation of cost and profit.

Only a few years ago it was still considered good practice to provide heavy reserves for depreciation when profits were good, and small reserves when profits were low.

This practice makes depreciation reserves an accounting convenience.

There is now a quite general recognition of the fact that depreciation is *not* an accounting convenience; it *is* an inescapable property fact.

As a property fact it can be measured only by a thorough and disinterested examination of the property, checked by recorded and long experience with similar properties.

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THE AUTHORITY

Hannah Pickett Mills, Rockingham, N. C., will increase the equipment to 81,728 spindles and 1,808 looms on print cloth numbers.

It is understood that the Dixie Spinning Mills, Chattanooga, Tenn., are considering the early addition of 3,000 spindles to the plant.

The New England Mill Situation.

With cotton 11 cents a pound lower than last year and with some progress being made in reducing the war time costs of production in New England mills, the situation in the industry is showing steady improvement. The demand for goods has not yet broadened to a point where profits are satisfactory but it is absorbing the output and promises to be much better after the turn of the year. Fall River has been slower in getting back to normal conditions than other sections. This is due largely to the ability of southern mills to supply the limited demand at prices Fall River print cloth mills cannot meet.

Attempts have been made in that center in meetings of manufacturers to bring about wage reductions. They have not proved successful, the most serious objections being made by those mills that have maintained operations fairly well and do not care to risk the chance of a strike that will shut down the plants and breed disturbances. While a great majority of manufacturers are convinced that a 12½ per cent reduction would be accepted without much friction there is no desire expressed to break away from the unity of a manufacturers' association wage regulation. Through changes being made in the methods of operation in some mills, labor costs have been reduced. Mills equipped with about half a million spindles are still totally idle, while others totalling an equipment of 750,000 spindes are running half time.

Estimates of the capacity operations in the city range from 55 to 60 per cent. In New Bedford, 14 miles distant, the mills are occupied to at least 85 per cent capacity but they are running wholly on fine or fancy cottons, while the Fall River mills that are not busy are equipped for print cloth yarn goods principally. The American Printing Company of Fall River is running to about 80 per cent capacity.

Rhode Island operations have improved steadily of late. Four of the plants of the B. B. & R. Knight branch of the Consolidated Textile Co., are now in full operation, and Fruit of the Loom 4-4 muslins are reported as having been sold ahead to April and withdrawn from sale. They were last offered at 19 cents a yard. The mills of the Lonsdale Company in Rhode Island are also running more fully than at any time in a year while the mills of the Manville Company are also reported as running in full.

Northern New England mills, especially those in Maine and New Hampshire succeeded in putting lower wage scales into effect without friction with operatives and they are now running nearer capacity than at any time this year. Russell H. Leonard, treasurer of the Ipswich Company and formerly treasurer of the Wampanoag mills, Fall River, has been elected treasurer of the Pepperell mills with headquarters in Boston and as he is recognized as one of the most progressive manufacturers, considerable interest attaches to his appointment. The Pepperell has increased its wide sheeting capacity in recent years and is now well sold up on these lines.

The Amoskeag Company of New Hampshire is now stated to be about occupied to 50 per cent capacity in the cotton goods division and to capacity in the worsted division. Steady progress is being made in restoring production at the Amoskeag and it is stated that by the early spring the mills will be running in full. In addition to the recent wage reduction of 10 per cent that went into effect in this plant many changes in methods of operation have been brought about and overhead costs have been materially reduced. What is considered of greater importance, however, is the growth of better relations between managers and operatives so that many needed changes in the methods of working machinery are being worked out. The company is producing many specialties and is not relying wholly upon a revival in the gingham business.

Wage reductions were accepted in the Everett mills of Lawrence, Mass., although they are situated in the largest center of wool manufacturing where wage revisions have not been attempted. This has led to larger operations at the plant. In the same way, reductions were announced and accepted in other gingham mills located at Lancaster and Waltham. Some more of the Western Massachusetts and Connecticut mills have also reduced wages in the endeavor to meet the lower costs of the southern mills.

The cotton movement into New England has been heavier in the past two months than at any time in a year or more and several mills have supplied themselves with stock for six months. As a rule, the mills have not bought in anticipation, save in the case of mills using staple grades that must be secured at the early part of the cotton movement. The difficulty of securing fine grades of long staple cotton from the American crop this year has caused considerable anxiety in New Bedford and in some other fine goods centers. Larger quantities of Egyptians have been bought to supply the demand for broadcloths and other fabrics in which mercerization figures largely in the finish.

So much has been written of dull business in New England this year that it has been a common assumption in popular channels that all New England mills were crippled. Even in Fall River, where the most of the distress centered, there were one or two mills that did not curtail production, and one, a yarn mill, since bought by the Firestone Tire Co., that operated steadily, night and day. Up in Maine the Lockwood wide sheeting mills ran steadily while there was no halt in the production of the Naumkeag Company where Pequot sheets are made. The American Printing Company's plant at Fall River actually turned out a greater yardage than it has in some recent years when no special public attention was called to the troubles of the textile industry. These facts do not mean that the business has been profitable, but it has not been dead.

A great many mills in this section are working on rayon mixtures. The immense increase in the output of this new fiber, heretofore known as artificial silk, may be inferred from a recent statement by one of the large producers. Last year the total output was estimated around 40,000,000 pounds in this country. At present the output is running well up to 1,000,000 pounds a week, or a 25 per cent increase in a single year. Knitters who want to use the fiber have been having difficulty in getting it from producers and have been advertising for any available lots in the general market, through the medium of the metropolitan news-

GLENN-LOWRY Y. M. C. A.

WHITMIRE, S. C.

Brunswick-Balke-Collender Co., July 25, 1924.
35 South Forsyth St.,
Atlanta, Ga.

Dear Sirs:

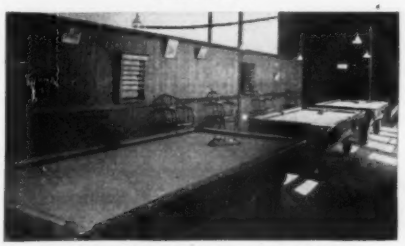
We have your request regarding our bowling equipment and billiard tables that have been in service for five years.

Will state that these features in our building are one of the great benefits that we have in co-operating with our employees. We all get together around the tables and in the bowling room and learn to know each other better.

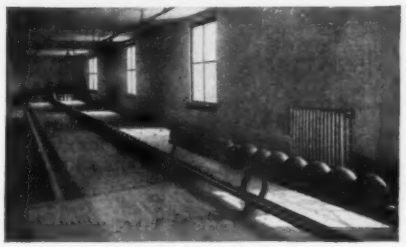
The equipment that we have has given us entire satisfaction and after about five years use is in A number one condition. We feel free in saying that we could recommend your equipment to any one who desires the very best of equipment and service.

Yours truly,
C. A. Albrecht
Mgr. Y. M. C. A.

Community Building, Glenn-Lowry Manufacturing Company, Whitmire, S. C.



A corner of the billiard room in this building.



The bowling equipment.

Fostering labor co-operation

A RECREATION centre in industrial plants brings greater co-operation between employers and employees. There is an enhanced employee good-will, a higher efficiency, better co-operation, and a noticeable reduction in labor turnover.

As evidenced by the letter and views illustrated above, the Glenn-Lowry Manufacturing Company, of Whitmire, South Carolina, has found its billiard and bowling equipment most beneficial in establishing contact with its employees and advancing the spirit of co-operation.

As makers of the world's finest billiard and bowling equipment, the Brunswick-Balke-Collender Company has furnished the equipment used in the country's most successful industrial welfare associations. The knowledge and experience thus gained is at the disposal of any one interested in this means of effecting a closer relationship between employer and employee.

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papers.

The bedspread mills in New England, such as the Bates at Lewiston, Me., and the Stevens at Fall River, have used immense quantities of the output so that at one time more than half their quilts were mixtures of rayon and cotton. In Rhode Island, where a great deal of fancy weaving is done, some mills are running at night using rayon as their chief raw material. A great deal of upholstery materials are being made in whole or part of rayon while the knit outerwear and the cutting up lingerie trades continue to use it freely. In fabrics its use is largely for decorative dress purposes and fine lingerie types.

New England manufacturers continue to give close attention to the discussions going on concerning the marketing and styling of cotton products. A number of them have agreed to make a showing at the Merchandise Fair to be held in New York next year by the National Retail Dry Goods Association. This may afford the cotton goods men an opportunity to show that no single division of the textile industry has been more progressive than the cotton industry in developing new styles in textures and in color arrangements. This year, because of the extraordinary vogue of novelty products in both the eastern and southern mills, is a time when a display of the sort may overcome the notion many Americans have concerning home-made textile products.

The demand for broadcloths and poplins has continued as one of the market features of wide interest in this section. The November imports of cloths of this description from England reached nearly 9,000,000 yards, while cable reports stated that 15,000,000 yards of fine goods were exported in November for this country. Of this volume it is believed that more than 10,000,000 yards consist of broadcloths. The domestic industry is believed to be turning out 50,000 pieces weekly in northern and southern mills combined. Prices run from 20 cents to 35 cents a yard with the bulk of the fine business being done within ranges from 21½ cents to 27½ cents. Hardly five per cent of the foreign goods come in finished so that domestic finishing plants get some benefit from the importations.

Cotton fabric finishers have been doing better in the past six weeks than at any time in a year. The largest job concern has work ahead on many lines into February. Much of the work being done is on rayon and cotton materials, broadcloths, sateens, and pongees. Less than the normal amount of staple finishing is reported. The largest bleachers are very busy on staple cloths but many of the small concerns have little to do in white goods. The job printers are inactive. Their business has been very slow, partly because of the uncertainty of designs and colorings but generally because of the unwillingness of converters to take style chances. A few finishers who are equipped for napping are producing some exquisite dress flannels of all cotton to meet the craze for flannel and suede finishes in the markets today.

Machine shops are getting busier. They are still only partially occupied and most of the new orders come from outside of New England. The vogue of novelties in woven fabrics is reflected in a very active demand for new machinery from the more expert loom builders and the manufacturers of attachments.

Yarn spinners are more active and the combed yarn industry is slowly pulling out of the depression they have been experiencing for more than two years.

The Cotton Market for the Year.

BY H. AND B. BEER.

New Orleans, December 10th, 1924.

For the first time in four years, or since 1920, the trade is favored with an ample supply of American cotton, due to a record acreage, small damage by weevil and an open fall for harvesting the crop, which has been gathered in excellent condition.

The crop will average high in quality but short of staple, as a result low grades and staples are scarce, the latter commanding big premiums. Because of the larger yield of lint cotton, estimated by the government at 13,153,000 bales vs. 10,140,000 bales last year, prices are lower, middling today 23.10 cents per pound compared with 34.50 cents per pound on the corresponding date last year.

Consumption of American cotton by the world last season was only 11,241,000 bales including linters, against 12,631,000 season before last, due to scarcity of supplies of the raw material at that time, which occasioned very high prices and the closing down of many mills throughout the world, and forcing other plants to resort to short time, in many instances half time, particularly in the North and in England.

This was the climax to consumption over-taking production during the past several years, resulting in the world's carry-over of American cotton from 1921, year after year, being reduced from 9,364,000 bales on July 31/21 to 2,319,000 bales on July 31/24.

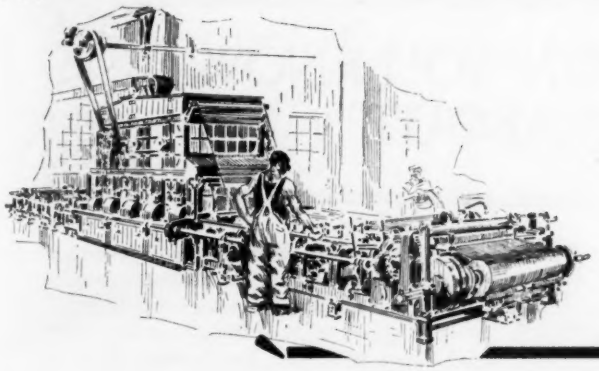
The production of short crops during the three consecutive years of 1921, 1922 and 1923 necessitated curtailment by the mills in America, Europe and Asia to such an extent as to reduce reserves of manufactured goods to the minimum the world over.

Fortunately the making of a good crop this year has served to stabilize the market, preventing wide fluctuations as were experienced the past few years, which is to the liking of the spinner and favorable for trade expansion. Already there is a revival of the spinning industry on both sides of the Atlantic and in the Orient, with prospects of further improvement in the future. Numerous New England mills, which have been closed for months, are resuming operations, while not a few of the southern mills are running full time, some night and day. The change for the better is also reported from over seas, particularly from Lancashire and from the Continent where the trade outlook has improved materially; prospects being the best in several years.

The recent political victories at the polls by the conservative element in the United States, England and Germany, following in the wake of the inauguration of the Dawes plan, which is improving the political and economic situation abroad, have done much to restore confidence in trade and financial circles, as denoted by the later quick and substantial recovery in the value of foreign exchange, especially sterling, which is gradually approaching par; it now being quoted at 4.69 7/16 vs. 4.66¼ at this time last year.

One factor of much import as regards the revival of domestic business, is the recent big advance in the price of grain, with the tendency to still higher price levels, which

(*Continued on page* 305.)



A New Slasher

AT the British Empire Exhibition at Wembley last summer the ***Revolving Swift Air Drying Sizing Machine,*** exhibited by Messrs. Howard & Bullough, Ltd., attracted unusual interest.

This machine possesses many advantages over the ordinary Cylinder Slasher, amongst which are unimpaired yarn strength, elasticity and roundness. Production is increased 25% to 35% and steam consumption reduced 30%.

We have recently installed several of these new Sizing Machines in well known New England and Southern mills. If you are interested in improving the appearance of your goods send for a descriptive circular of the machine.

H & B
AMERICAN MACHINE COMPANY
Builders of
COTTON MACHINERY
PAWTUCKET, R. I.

BOSTON OFFICE
200 DEVONSHIRE ST

SOUTHERN OFFICE
815 ATLANTA TRUST CO. BLDG.
ATLANTA, GA.

NOTES ABOUT MEN YOU KNOW OR KNOW ABOUT

F. L. BRANSON, who for the past several years has been general manager of the B. B. & R. Knight, Inc., with offices in Providence, R. I., has become president of the Graniteville (S. C.) Manufacturing Company, with mills at Graniteville, Warrenville, and Vaucluse, S. C. Mr. Branson's headquarters now are at Graniteville, S. C.

CALVIN E. SWEET has become general manager of B. B & R. Knight, Inc., Providence, R. I. Mr. Sweet has been assistant general manager for some time.

I. W. CURTIS, formerly superintendent of the Maverick Mills, East Boston, Mass., is now superintendent of the Sharp Mfg. Company, New Bedford, succeeding Robert Schofield, resigned.

E. CLINTON SWIFT, formerly general manager of the Maverick Mills, has become general manager of the Sharp Manufacturing Company at New Bedford.

F. LEE GAVITT has become agent of the new plant of the American Thread Company, at Dalton, Georgia. Mr. Gavitt formerly was agent of the Glasgo (Conn.) Yarn Mills of the same company.

G. L. CHAPMAN, formerly superintendent of the Woodstock Cotton Mills, Anniston, Alabama, has become connected with the Cotton Mill Products Company, at Natchez, Miss.

S. F. FOWLER now is superintendent of the Asheville Knitting Mills, Asheville, N. C.

E. LEE SKIPPER, superintendent of the Kershaw Cotton Mills, Kershaw, S. C., was married on December 6th to Miss Thelma Hart Salley, daughter of Mr. and Mrs. T. L. Salley, of Orangeburg, S. C. The wedding took place at the Presbyterian Church in Orangeburg, S. C.

E. K. HUDSON, until recently overseer of weaving at the Camperdown Mills, Greenville, S. C., has taken charge of night weaving at the Mills Mill, Greenville, it is reported.

W. B. DILLARD has become overseer of warping and finishing at the Aragon Mills, Aragon, Ga.

W. J. JENNINGS, formerly at Gibsonville, N. C., has accepted the position of superintendent at the Catawba Spinning Company, Mt. Holly, N. C., succeeding N. P. Bumgarner, resigned.

R. F. GARDNER, formerly superintendent of the Klumac Cotton Mills, Salisbury, N. C., has gone to the American Cotton Mills, Inc., Bessemer City, N. C., in a similar position.

W. S. MOORE has resigned as superintendent of Mills Mill No. 2, Woodruff, S. C.

WRIGHT BOLTON, who three years ago resigned as superintendent of the Acushnet Mills, New Bedford, following a breakdown in his health, is to resume his duties with the corporation as general superintendent.

ROBERT RUSSELL, who succeeded Mr. Bolton at the Acushnet, has tendered his resignation to become general superintendent of the Dartmouth Manufacturing Corporation, New Bedford, Mass.

JOHN J. HARNES, formerly assistant superintendent at the Acushnet Mills, New Bedford, has accepted a similar position at the Dartmouth Manufacturing Corporation.

J. R. MOORE has succeeded N. B. McCanless as manager of the Halifax Cotton Mills, Inc., Mt. Pleasant, N. C.

P. G. MERROW, secretary and treasurer of the Merrow Machine Company, Hartford, Connecticut, sailed November 26th on the S. S. Berengaria for a short European trip, during which he planned to visit the company's connections in England and Western Europe.

M. J. BENTON has become overseer of weaving at the Lullwater Manufacturing Co., Greenville, S. C. He formerly was at Hogansville, Ga.

E. H. STEERE, formerly at the Clinton, Tenn., plant of the Magnet Knitting Mills, as superintendent, has become superintendent of the Asheboro Hosiery Mills, Asheboro, N. C.

RUSSELL B. NEWTON, it is reported, has been promoted to the position of assistant superintendent at the Columbus (Ga.) plant of the Bibb Manufacturing Company. Mr. Newton graduated from the Georgia School of Technology in 1920.

T. H. FULLER has accepted a position as overseer of dyeing with the Elberton (Ga.) Mills. He graduated from the Georgia School of Technology in 1914.

H. P. HUNT is now overseer of carding at the White Oak Cotton Mills, Greensboro, N. C.

PARKER TUCK is the superintendent of the Houston Textile Mills, Houston, Texas, which have been completed, for the manufacture of cotton blankets.

C. C. MCGINNISS has returned to his former position with the Mason Cotton Mills Co., Kings Mountain, N. C. He has been in charge of spinning and twisting at the Park Yarn Mills Co., Kings Mountain. Mr. McGinniss is succeeded at L. F. Merrill.

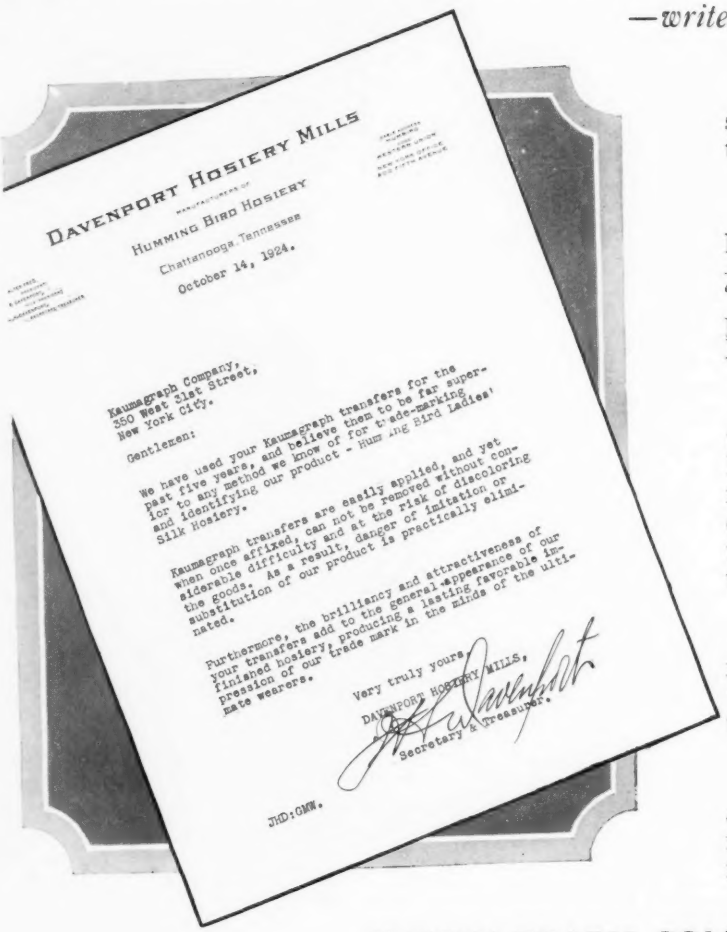
J. E. BROWN has resigned as overseer of cloth room at the Enterprise Manufacturing Company, Augusta, Ga., to become overseer of finishing at the Gregg Dyeing Company, at Graniteville, S. C.

S. Y. AUSTIN, vice-president and general manager of the Hillside Cotton Mills, LaGrange, Ga., it is understood, has become general sales director of the Callaway Mills, Inc., with offices at 345 Broadway, New York City. It is reported that William W. Arnold, Jr., of Manchester, has been made general superintendent of the Hillside Cotton Mills and the Unity Spinning Mills, in addition to the Milstead Mfg. Co., the Unity Cotton Mills, and the Manchester Cotton Mills.

EDWIN HOWARD has been made southern agent of Woonsocket Machine & Press Company, Inc., Woonsocket, R. I.; Fales and Jenks Machine Company, Pawtucket, R. I.; and Easton & Burham Machine Company, Pawtucket, R. I. Offices will be located in Rooms 1400-1401, Woodside Building, Greenville, S. C. Associated with Mr. Howard, as selling agent, is William Lee.

"danger of imitation or substitution is practically eliminated"

—writes Davenport Hosiery Mills



DAVENPORT HOSIERY MILLS

HUMMING BIRD HOSIERY

Chattanooga, Tennessee

October 14, 1924.

Kaumagraph Company,
350 West 31st Street,
New York City.

Gentlemen:

We have used your Kaumagraph transfers for the past five years, and believe them to be far superior to any method we know of for trade-marking and identifying our product - Humming Bird Ladies' Silk Hosiery.

Kaumagraph transfers are easily applied, and yet when once affixed, can not be removed without considerable difficulty and at the risk of discoloring the goods. As a result, danger of imitation or substitution of our product is practically eliminated.

Furthermore, the brilliancy and attractiveness of your transfers add to the general appearance of our finished hosiery, producing a lasting favorable impression of our trade mark in the minds of the ultimate wearers.

Very truly yours,
DAVENPORT HOSIERY MILLS,
Secretary & Treasurer.

JWD:GMW.

Permanency which prevents substitution is only one of the good features of Kaumagraph Transfers.

Equally important is the smart appearance of goods marked in this way. A famous user calls Kaumagraphs "the only method we know of to apply our trademark so legibly and handsomely."

When you add to these advantages the ease and quickness with which Kaumagraphs are applied — "we mark 80 dozen pairs an hour" writes one firm—it is not hard to see why the leaders in the hosiery field are using this method of marking.

Our new lithographic department now enables manufacturers to get their labels, hang tickets, etc., and transfers all from the same source.

Write to us for full information about this Service and for sample markings of the transfer that does not wash off, wear off or tear off.

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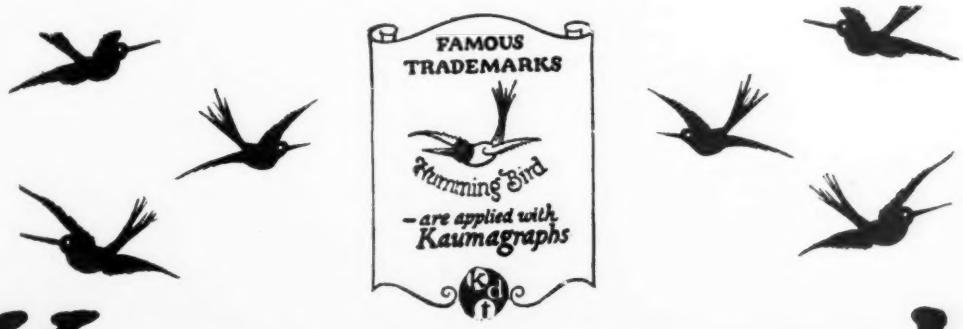

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OUR many years of experience in this line places us in a position to advise and assst you on any bobbin or shuttle problem you might have. The harder they are the better we like them.

The satisfaction Southern textile mills are securing by the use of U S B & S Co. products is very much in evidence by the many repeat orders we receive from them.

If you are not receiving the desired results you expect from the bobbins and shuttles you are now using, we ask only a chance to demonstrate just what U S B & S Co. Products will do. Samples of any U S Product will gladly be mailed upon receipt of request from you—don't wait until tomorrow—drop us a line today!

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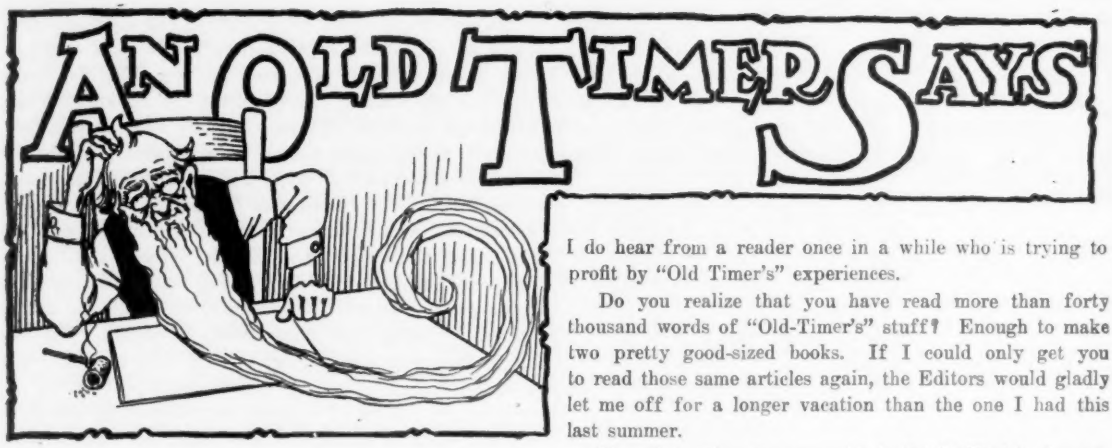
Eight Factories — Providence R.I.

Eight Big Plants Stand Back of U S B & S Co. Products



For about three years I have made an effort to give my readers a new line of thought with each "Old Timer" article. I have tried to plan each "attack," as some of my readers seem to regard my articles, from a different angle. I have made several rushes at you straight from the front—tried my level best to hit you right between the eyes—then I would slip around when I thought you were not looking, and chunk a rock at you from the back side.

The Editors tell me that some of the readers also have claimed that I sometimes hit below the belt, which is not considered fair, I believe. But "to give the Devil his dues," as the old saying goes, you will have to admit that I have talked real nice to you a few times and made an honest effort to persuade you to take the advice of an "Old Timer" who has had, what he thinks is more than his share of hard knocks, as well as some experiences that you could profit by if you would only lend a receptive ear.

I'll admit that I have often wished that it were possible for me to get all my brother overseers and superintendents together in one big enclosure surrounded by a brick wall about ten feet thick, and too high for them to jump out—then, if I were only physically able, I would take a stick and just beat the dickens out of every one of you until I made you wake up to your unlimited opportunities. I would make many of you admit that you would not "hire yourself for your job." I would make you see where you are losing valuable time by not applying your spare time to the study of textbooks and that you are reading COTTON in a haphazard kind of way and not studying its contents like you should. You needn't think you can open your COTTON and read "Old Timer" and then not be able to remember next day what the article was about without my knowing it.

Sure, I know that the great majority of readers let my "dope" go in one ear and right on out through the other ear, just like they do the technical articles they read. And I often think, "what in the devil is the use of sitting at my desk night after night in an humble effort to save some overseer or superintendent from falling down on his job—straining every nerve, so to speak, trying to give some man inspiration to spur him on to that 'big job'—when I could be sitting back reading a good detective story or hanging around the barber shop or drug store swapping jokes with the crowd."

But no! Not by a darn sight will I let up as long as I do hear from a reader once in a while who is trying to profit by "Old Timer's" experiences.

Do you realize that you have read more than forty thousand words of "Old-Timer's" stuff? Enough to make two pretty good-sized books. If I could only get you to read those same articles again, the Editors would gladly let me off for a longer vacation than the one I had this last summer.

Oh, well! It's a funny world, isn't it? That is, I mean the people in the world are funny. Of course, "funny" is not the real word I would like to use, but if I put down just what I would like to say those confounded Editors would not print it, so we will let it go at that.

You know, we have to tell and show the doffers how we want them to piece up, the card hand how he must strip and lay his laps on the card, the weaver how he must not make bad cloth, the oiler how he must oil the places that he has to bend his back to get to—and then, by Golly! we have to go right back next day and tell them the same darn thing over again.

Now don't get huffy, and think I'm calling you a doffer or anything like that, but I have already told you about *Opportunity*, and I am going to give you some more just like it. I may not say it just like I did before, but it is the same Opportunity, anyway.

You know, they claim that there is nothing new under the sun. Certainly opportunity is not new. But the way some overseers and superintendents look at it and talk about it, you would think it was just hatched out this morning. In fact it looks to me like some men actually run from Opportunity like it was a rattlesnake, while others waste it in the same way they do their monthly check or weekly pay.

There is actually so much of it wasted by the majority of people that the fellow who is really trying for all he can get, generally finds more than he can handle. Let me give you an actual illustration that happened less than one year ago.

Eighteen years ago I was superintendent of a mill located in a town where a good friend of mine was overseer of spinning in another mill. Later he was promoted to superintendent of a mill in another town many miles away, and I did not come in contact with him for several years.

He finally quit the mill business and branched out into business for himself. He made a success. He became well known throughout the textile industry. He is now located not far from my home. A few months ago he drove up soon one morning, and I thought of course he had come on his regular business trip. After a few minutes' conversation he said, "Let's go out on the porch and have a smoke." Then, "'Old Timer,' I've come for some advice."

"What's the matter, Ben? Have you gone broke?"

"Hell, no! I've got an offer of the biggest job I ever dreamed of getting. It will pay me $10,000 more per year than I am making."

"Well, by George, why don't you grab it, hook, line, sinker, and all?"

"That's just what I've come to talk to you about, 'Old Timer.' I know you have some idea about the line of work I would be expected to do for this firm, and I want you to tell me whether you think I have education enough to hold it down?"

There was the rub. This position required a man who was a good mathematician, and just to tell the truth, Ben couldn't work out a simple example in proportion or percentage to save his life.

Yet he is a success in the business he is in because there are no mathematical problems involved, and he is able to hire his own bookkeeper and stenographer.

Say, brother! How about that for "Opportunity"? Ten thousand per year is a pretty good salary, but to be offered that much more than you are already making—Holy smoke!

After he was gone, I thought how easy it would have been for Ben to have prepared himself for just this opportunity if he had only started eighteen years ago when we were working together.

How about you, Mr. Overseer? Mr. Superintendent? Are you preparing yourself for that bigger job, or will you be like my friend Ben when it does come?

Not always does a man know of his opportunites, because his superiors feel him out in some way to find out if he is qualified for a certain position. If they find he is not, then he never knows he would have been promoted if he had only been *ready*.

An instance like this occurred not two years ago that I will tell you about. I know the man it happened to is going to read this article and I know he will certainly realize I am talking about him. Therefore, I hope he will not be offended but that he will profit by the experience and study the correspondence course which he is taking (and which is already paid for) so that he will be *ready* for the next Opportunity.

A certain well-known mill employed a young man as overseer. He made good. The president called him into the office one day and told him so. The superintendent was told he would have to look for another position, but they would give him a reasonable time to find a place.

Meantime, it was found out that this young man did not have the education they thought he had. He could not make the mill calculations necessary to successfully run the mill. They also found out that the young man had the very bad habit of "cursing" which the president thought was a big handicap to a young man who expected to manage help. He also found out one other bad quality that the young man had which I suppose I should not mention—yes, I guess I will, because it may do some other young man some good even if it hurts this young man's feelings. The president found out that he could not always *depend upon* what the young man told him concerning his work.

The young man lost his first big opportunity, but if he will only profit by his experience and take the advice "Old Timer" has given him, he will have another Opportunity and it will not be long in coming.

The advantages which every overseer and superintendent obtain are practically in proportion to the work they put forth to secure them. You can't get something for nothing. You must *make* your Opportunities by working like the dickens for them. I mean, not only work at your job, but study in your spare time to gain knowledge which will make you a magnet that Opportunity will fly to like metal shavings will fly to a horse-shoe magnet.

The man who is *ready* for Mr. Opportunity when he comes along is the man who succeeds. Success and Opportunity are full brothers. It is a well recognized fact that if you prepare yourself, Opportunity will find you, and if Opportunity finds you, then Success is certain. The one big trouble with the average man is that he hasn't got backbone enough to prepare himself for Opportunity.

There is a story of a young man something like this: When a stranger knocked at the door, this young fellow said, "Who are you?" "I am called Opportunity," said

"AND HE SLAMMED THE DOOR IN HIS FACE."

the stranger. "Well," said the young man, "I have been waiting to see my Opportunity for a long time, but you look like hard work to me," and he slammed the door in his face.

Oh, if I only had some way of showing the overseers and superintendents that they are slamming the door in the face of Opportunity more often than they will ever know!

If the young overseer referred to could only have known of the Opportunity that was doing its best to get him to recognize it—well, of course he would now be running that mill.

It all seems so simple when you see it in the *"other fellow."* You say to yourself, "What a fool he was; why couldn't he have seen it!" Confound it, can't you ever understand that I am talking to *You.* You, the fellow who is reading this article. *You! YOU!* *—?!*—?!!!*—

Gosh darn it! I wish I had some way to shout it so loud that it would ring in your ears forever!

I have been very much interested in radio since it came out, and it has been hard for me to realize that all kinds of interesting things are all around me every hour of the day, and that it matters not where I am—out in the woods

forty miles from nowhere or sitting at my desk as I am right now—all I need is a piece of wire, a tube and some batteries and I can tune in any time onto this vibrant atmosphere. It's the same way with Opportunity, Mr. Overseer, Mr. Superintendent—it is all around you all the time if you would only *tune in.*

But we drift along day after day, month after month, year after year, neglecting chance after chance for self-improvement, with all those talents we have been given undeveloped, weak where we should be strong—just common everyday overseers and superintendents when we might have been classed as among the "Best."

The fellow who makes me tired is the fellow who begins to whine about all the big Opportunities being gone. He doesn't see any hanging around where he works, and all that kind of bunk.

That fellow is too darn lazy to "tune in." He can't see Opportunity because it looks like hard work and personal sacrifices. He wants to succeed, oh, yes! of course, but he is not willing to pay the price.

Opportunity will always look like "Hard Work" to the lazy, the indifferent cuss who never thought it worth while to prepare himself so that Opportunity could take hold of him. It looks like "Hard Work" to the fellow who is trying to bluff his way through, or the fellow who thinks "Luck" will come along and put him into a good job.

But to the fellow who is dead in earnest, who is determined to make a place for himself, who is willing to pay the price of success in downright hard work—well, Opportunity looks like a great chance to make good, a chance to show he is made of the right kind of stuff. It doesn't look like "Hard Work" at all, and it is not. There is more genuine pleasure in making a success, in doing something above the common crowd, than anything a human being can do.

Speaking of chances—Great Scott! Remember my friend, *the good chances are just beginning. There are ten good chances in the mill business today where there was one when "Old Timer" came along.*

Every new invention of cotton mill machinery, every new idea of operation, every new method of manufacture, every forward step taken by successful overseers and superintendents, as described and explained in COTTON and other magazines, and by machinery builders, opens up unheard of chances, opens wide new doors of Opportunity to the overseer or superintendent who is ambitious and who is willing to work.

I have just read an account of some of the trials that Booker T. Washington went through in his long struggle for success. He was born a slave. He worked first to support life, then he worked to get an education, and then, to make a long story short, *he succeeded.*

A black negro! Surely you couldn't say that he had as good a chance as you. You are already an overseer or a superintendent; just think of the thousands of men who would count themselves fortunate to have your chance. Chance! What more could you ask for? You certainly have the chance to make your own Opportunity.

The average young man cannot see why he should serve such a long apprenticeship before he is promoted. The one big risk with every textile graduate who enters mill work is whether he will successfully pass over that period of time in which he thinks that he is ready for promotion, but he can't see for the life of him any likelihood of his being promoted. I say if you can steer the young man over that period you have gone a long way toward making a mill man of him.

Some few men do get to be overseers and superintendents without actually having operated machines or having run a section for a living—but that kind of man will be handicapped all the balance of his life, it matters not how successful he becomes.

Knowing nothing of the difficulties that beset all beginnings he can never develop his ideas to others in the same way he would have done if he had had that actual experience. That is why you rarely see a rich man's son who is a successful business man. He just simply can never get the point of view about anything that he would have had if he had been compelled to get down and dig for it like you and I have had to do.

I bring this point out, not only in the hopes of encouraging some textile graduate who has been in the mill two or three weeks and feels like he should be promoted to overseer on the first of the month; but also to show the

overseer and superintendent who have not had the technical education that *they* have got something that the textile man hasn't got, and *he* has something they haven't got.

It's about an even break—50-50.

The textile graduate can get the practical training if he is willing to work and if he will only be patient; and the practical man can get his technical training if he has backbone enough to study for it.

These are the kind of things which make Old Man Opportunity friendly with you.

I would like to tell you many other things about Opportunity, but I am already taking up too much space and can see the Editors frowning. If "Old Timer" did seem to lose his temper back toward the middle of this article, please remember that he was trying very, very hard to get you to realize for your own personal benefit that *"you don't have to hunt opportunities."* They are all around you—*tune in!*

The secret of success is to be ready when your opportunity comes.

Character – Best of all Collateral

The late J. P. Morgan said:

"I have known a man to come into my office, and I have given him a check for a million dollars when I knew they had not a cent in the world. The first thing is Character. *Before money or anything else. That is the rule of business."*

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The Detailed Audit Report, above all other factors, serves to establish a relationship of mutual understanding and trust between Banker and Business Man.

It is the *one* instrument that can give the Banker a complete picture of a business in all essential details. It is the *only* instrument that can satisfy him that his client does business on facts, based on dependable figures.

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Why Does This Yarn Break on the Spoolers?

EDITOR COTTON:

Will some reader of COTTON tell me where my trouble is? I am having difficulty with my yarn breaking down on the spoolers. We are using middling cotton, making a 17¾-ounce lap with draft of four on the pickers, beaters 1,300 r.p.m., 45-inch lap. The cards have a draft of 95.50. Speed of cylinder 165. Speed of doffer 12, diameter 28 inches. Weight of sliver 75 grains.

Two processes of drawing. First drawing six doublings, draft 6, weight of sliver 72 grains. Second drawing same as first. Weight of sliver 72 grains.

Slubber has a draft of 3.75, making .42 hank roving. Speeder 2 in 1 with a 7½ draft, making 1.53 hank roving. Spinning making 14½s warp from the 1.53 hank roving, single. Size of rings 2 1/16-inch, No. 2 flange. Speed of cylinder 875 r.p.m. Speed of front roll 115 r.p.m. Length of traverse 7½ inches, warp wind. Draft of frame 10. Spindle speed of spinning 6,863 r.p.m. Speed of spooler cylinder 180 r.p.m. Speed of spindle 772 r.p.m. Size of spools 4½ x 6½. Spool weighs three pounds when full. Warper: Speed of cylinder 54 r.p.m. Size of beam barrel 9 x 54½ inches. Size of beam head 28 inches.

My work runs fairly well on spinning and warper, but snaps down on the spooling. If some reader will tell me where the trouble is it will be very much appreciated.

C. AND S. (GA.)

Licker-in Speeds.

EDITOR COTTON:

In reply to the question on licker-in speeds in the November issue, asked by "U. J. (N. C.)," will say for his benefit and for the other readers, above all, don't run the licker-in too fast; what I mean by "too fast" is over 350 r.p.m. And I mean that regardless of the weight of lap or grade of cotton used. Of course, in using extra good cotton the licker-in would stay sharp longer. But I do say that high speed does not do the work any good. I am at present running my lickers-in at 350 r.p.m., with satisfactory results.

"U. J.'s" cylinder speed of 160 r.p.m. is, to my way of thinking, all right; I run mine at that speed, with a doffer speed of eight turns per minute.

When I first took charge of my present position the lickers-in were running around 400 r.p.m. and I at once reduced the speed to 350 r.p.m., and since doing so I have not had one-half the dull lickers-in I had before. And I am getting a better and cleaner card sliver, running 1¼-inch staple cotton of a fair grade. It is much better to run the licker-in at a low speed than it is to run at high speed and have to keep sending them to the shop to be reground.

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

Some mills have a licker-in grinder of their own, which is a good idea. But even at that, if they are ground once every two or three weeks the teeth soon will be too short, and the result will be new covering and extra expense for the carding department. I reduced the licker-in speed for two very good reasons. First, to save the wear and tear, and expenses; and, second, to produce better work on the cards, which it did. A high licker-in speed will certainly damage the work and the licker-in as well, regardless of the weight of lap or the grade of cotton. EXPERIENCE (CONN.)

EDITOR COTTON:

In response to "U. J. (N. C.)," who asked a question with reference to licker-in speeds for 1¼-inch cotton, I would recommend a licker-in speed of 320 r.p.m. for 1¼-inch staple stock. This, of course, is assuming that the licker-in is in good condition. A licker-in with burred or bent teeth will not give good results at any speed.

I note that "U. J." is making 9-ounce lap and a 37-grain card sliver. If I were in his place I would make a heavier finisher lap and increase the card draft to at least 118 or 120; if his beaters are in good condition and he is not beating too much for the long staple, this longer draft will give him better carding and will not reduce the breaking strength. With properly opened cotton, plenty of cleaning surface over the grids will eliminate so much beating in order to get the cotton suitably cleaned.

I am now using a lower licker-in speed than formerly, and using only two picker beaters, one 2-blade and one Kirschner. I increased the card draft from 98 to 124, slightly shortening the drafts on the other processes. The result is that I get a ten per cent better breaking strength in my cloth on two numbers finer warp, with the same twist per inch as in the heavier yarn. O. G. (S. C.)

EDITOR COTTON:

In regard to licker-in speeds, and in answer to "U. J.," who asked a question concerning them in the November issue, would say that this is a very important subject and one which should be very carefully considered.

In the duties and functions of the different parts of the card as they act individually and in connection with their adjacent parts, none plays a greater share in the conversion of the uneven mass of fibers filled with motes, dirt, sticks

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Heddles — Harness Frames — Selvage Harness—Leno Doups—Jacquard Heddles—Lingoes—Improved Loom Reeds —Leno Reeds—Lease Reeds—Beamer Hecks—Combs.

and burrs into a clean even web than does the licker-in acting in conjunction with the mote knives.

We are dependent upon this section of the card for the major cleaning process, and for all our combing action when combing machinery is not in use. A comparison of the weight of the foreign matter found under the licker-in with the total found in the original stock is sufficient evidence of its importance as a cleaning mechanism alone.

The spiral construction of the licker-in wire produces an unbroken line of points so that no two teeth can possibly follow each other in the same path during the revolution of the licker-in. While one inch of lap is being taken in it is acted on by more than 2,500,000 teeth, which results in a great deal of lap being transmitted to the cylinder as individual fibers.

However, not all the lap is taken in as individual fibers; due to the irregular and unparalleled mass of the stock, small tufts cling together and are carried in, but the size of these tufts has been reduced to a minimum.

At no one stage in our processes does such a radical change take place in the state of the stock as at the licker-in. The cleaning which takes place at this section of the card is dependent upon the centrifugal force of the licker-in. A great many experiments have been made in varying the speed of the licker-in, and at no time have we been able to get satisfactory results from the low speeds. We get a much cleaner sliver from our cards with a speed of above 500 r.p.m. on the licker-in. JOE (N. C.)

EDITOR COTTON:

"U. J. (N. C.)" would like some discussion on licker-in speeds and would like opinions of readers of this department.

There is very little to discuss on this subject. It makes no difference whether you are running 1¼-inch staple or 2-inch staple the surface velocity of the licker-in must at all times be a little less than ½ the speed of the surface velocity of the cylinder. In other words, when the cylinder revolves at a rate of 2,200 feet per minute, the licker-in should be made to revolve at 1,000 feet per minute.

Wash (R. I.)

A Question for Spinners.

EDITOR COTTON:

I would like to see a little discussion concerning double creel roving being used on spinning frames. It looks to me like a good many of the mills are going on double roving regardless of the expense, and others would go if it were not for the expense.

Here is what I have been studying and wondering over, can't the doubling be done in the card room to an advantage? Say take the intermediate and fix the trumpets on the traverse rod so as to have two ends running side by side in the drawing rolls. By doing this two ends can be twisted together and run on one bobbin at the front. Then think of the extra turns the front roll will have to go to compensate for the increased size of the roving. With the ordinary creel on fly-frames, only half the spindles could be used, but after all the production is in proportion to the size of the roving and the speed of the front roll. This roving would be set in the creels of the speeders as its predecessor was.

I know of a mill that is making a 4.25 hank roving using double creel roving in the spinning room and is running their carding day and night to keep the spinning running. Now if they could be successful in twisting two ends together even at the last fly-frame, wouldn't this increase their production? As the two ends would be twisted together they would be larger than one, and the two together would not require the twist that the fine roving did. After twisting two together the roving would be a 2.12½ hank roving and would be set in the creel of the spinning frame as a single roving, but still it would be a double roving.

As was stated before, with the ordinary creel only half the spindles can be used, but the front roll speed would be much greater. I would like to see some discussion along this line. W. G. (GA.)

What Causes Variation on Sliver and Ribbon Lap Machines?

EDITOR COTTON:

Is there any way to eliminate variation on Whitin sliver and ribbon lap machines? My experience is that one yard from a full lap will weigh very much heavier than a yard from the same lap when it is run down very small—the difference ranging from 8 to 24 grains. I think I understand why this is true, but do not know just how to overcome it. I should be glad to see some opinions from readers of COTTON as to what causes this variation, and how it can be overcome. L. M. (N. C.)

Figuring Color Percentages on Heather Yarn.

EDITOR COTTON:

In reply to "N. O. B. (N. C.)" concerning his question on colors in heather yarn. The information he gives is that he desires to make 18s heather yarn as follows:

Run on intermediate, one end of .50 hank of color *B*; one end 1.00 hank color *O*. This gives a stripe of 1.35 hank. Now run one end of this stripe on the speeder with one end of 1.00 hank color *N*, making 4.00 hank roving. This stripe is run on spinning with one end of 4.00 hank color *B*. He wishes to make 5,750 pounds of this heather. His question is, "What per cent of each color will it take?"

With the foregoing information we get an organization as follows:

.50 hank color *B* + 1.00 hank color *O* = 1.35 stripe (intermediate).

1.35 hank stripe + 1.00 hank color *N* = 4.00 hank (speeders).

4.00 hank + 4.00 hank color *B* = 18s (spinning).

The procedure which I used was: find the total number of yards in finished product. Then, after finding the draft in spinning, I found the number of yards required "in the creel" in spinning.

Then knowing that and after finding the draft on the speeders, I found the number of yards required on speeder creels.

Then I found the number of yards of stripe and color *N* required. Then after finding the draft on the intermediates, I found the number of yards of .50 hank color *B* required and 1.00 hank color *O* required.

Then I found the percentage of color *O* required by di-

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viding the number of yards of color *O* required by the total yards required to make the batch, which gave about 24.78 per cent (by logarithms).

Taking color *N* in the same fashion gave about 27.81 per cent (by logarithms).

Then for color *B*, I added these percentages and subtracted the sum from 100 per cent, giving 47.41 per cent for color *B*.

(You will note that I ignored the item of waste because I thought the waste would be in the proportion of each color used.) I think that figuring in this case gives only an approximation. H. D. (MASS.)

EDITOR COTTON:

In the October issue of COTTON "N. O. B. (N. C.)" asks questions on the percentage of several different colors required to make 5,750 pounds of heather yarn. I offer the following solution, which I hope will be both clear and satisfactory and will meet his needs.

I shall work backwards from the spinning where we are using a 4.00 hank color *B* roving and a 4.00 hank stripe consisting of colors *BNO*. It can readily be seen that it will require equally as much of color *B* as of stripe *BNO*, both being 4.00 hank. Naturally that is 50 per cent or 2,875 pounds.

We now have:

50 per cent or 2,875 pounds of color *B* 4.00 hank and
50 per cent or 2,875 pounds of color *BNO* 4.00 hank

This 2,875 pounds of *BNO* is made from 1.35 hank stripe *BO* and 1.00 hank color *N*. We must now find the weight of each of these hanks required. A good rule is this:

RULE:—Find the resultant counts of the two yarns folded together; then as the counts of one yarn is to the resultant counts, so is the total weight to the weight required of that yarn.

Thus: $\frac{1.35 \times 1.00}{1.35 + 1.00} = \frac{1.35}{2.35} = .574$ resultant counts

Then 1 : .574 :: 2,875 : X (weight required of 1.00 hank color *N*) or $\frac{2{,}875 \times .574}{1.00} = 1{,}650.25$ pounds of 1.00 hank color *N*.

1,650.25 ÷ 5,750 = .287 or 28.7 per cent of 1.00 hank color *N*.

2,875 pounds — 1,650.25 = 1224.75 pounds of stripe *BO*.

This 1224.75 pounds of stripe *BO* is made from .50 hank color *B* and 1.00 hank color *O*.

We use the same method as before, first finding the resultant counts:

$\frac{1.00 \times .50}{1.00 + .50} = \frac{.50}{1.50} = .33\frac{1}{3}$ resultant counts

Then 1.00 : .33⅓ :: 1224.75 : X (required weight of color *O*) or $\frac{1224.75 \times .33\frac{1}{3}}{1.00} = 408.25$ pounds of 1.00 hank color *O*.

1224.75 — 408.25 = 816.50 pounds of color *B* .50 hank.
408.25 ÷ 5,750 = .071 or 7.1 per cent of color *O*.
816.50 ÷ 5,750 = .142 or 14.2 per cent of color *B*

We now have 50 per cent of color *B* 4.00 hank.
and 14.2 per cent total color of *B*, .50 hank
or 64.2 per cent total color of *B*.
28.7 per cent total color of *N*.
7.1 per cent total color of *O*.

Total 100.0 per cent.

W. O. R. (MASS.)

EDITOR COTTON:

In reference to figuring colors in heather yarns, as asked by "N. O. B. (N. C.)" in the October issue of COTTON, I trust that my solution may be of some help to him; and, that this may be more clearly understood, I am repeating his question:

"We desire to make 18s yarn, as follows: Run on the intermediate one end .50 hank of color *B*, one end 1.00 hank color *O*, this gives a stripe of 1.35 hank. Now run one end of this stripe on the speeder with one end of 1.00 hank color *N* making 4.00 hank roving. This stripe is run on the spinning with one end of 4.00 hank color *B*. We wish to make 5,750 pounds of this heather. What per cent of each color will it take?"

Starting with the spinning there is to be 5,750 pounds of 18s heather yarn, spun from roving in the creels of 4.00 hank *B* and 4.00 hank stripe or as the hank rovings used are identical as to size then there must be 50 per cent of 5,750 pounds or 2,875 pounds of each of 4.00 hank *B* and 4.00 hank stripe.

Now considering the 4.00 hank stripe which is drafted from hank rovings of 1.00 hank, color *N*, and 1.35 hank stripe. It is necessary to obtain the creel rovings on a weight basis.

1.00 hank equals 8.33 grains per yard
1.35 hank equals 6.17 grains per yard

14.50 grains per yard of roving fed at back of machine. This proportion will hold true at front of the machine or there will be

$\frac{8.33 \times 100}{14.50} = 57.4$ per cent of 1.00 hank, color *N*.

$\frac{6.17 \times 100}{14.50} = 42.6$ per cent of 1.35 hank stripe.

This equals .574 × 2,875 = 1,650 pounds of 1.00 hank color *N*.

.426 × 2,875 = 1,225 pounds of 1.35 hank stripe.

Now the 1.35 hank stripe is drafted from hank roving .50 hank, color *B*, and 1.00 hank, color *O*.

1.00 hank equals 8.33 grains per yard
.50 hank equals 16.66 grains per yard

Total 24.99

$\frac{8.33 \times 100}{24.99} = 33\frac{1}{3}$ per cent of 1.00 hank, color *O*.

$\frac{16.66 \times 100}{24.99} = 66\frac{2}{3}$ per cent of .50 hank, color *B*.

.3333 × 1225 = 408 pounds color *O*.
.6666 × 1225 = 817 pounds color *B*.

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Then the total pounds of each color necessary for this heather yarn follows:

Color *B* 2875 pounds + 817 pounds = 3692 pounds
Color *N* = 1650 pounds
Color *O* = 408 pounds

Total = 5,750 pounds

The percentage of each color is:

Color *B* = 64.21 per cent
Color *N* = 28.69 per cent
Color *O* = 7.10 per cent

In order to make 5,750 pounds of yarn, one should figure these percentages on an amount sufficiently larger than 5,750 pounds, so as to allow for waste losses.

If any reader does not understand the foregoing procedure, I shall be glad to explain further. BERT (R. I.)

EDITOR COTTON:

I was greatly interested in trying to figure the colors for the heather yarns, as requested by "N. O. B." in the "How Other Men Manage" department of the October issue. I am sending herewith two methods, and shall be interested in seeing other replies. This department of your paper is very interesting and instructive, for it is indeed good to know "how other men manage."

The first method is: Fed into the intermediate is one end of .50 hank of color *B*, and one end of 1.00 hank color *O*; therefore the resultant hank delivered will contain two parts of color *B* to one part of color *O*, as .50 hank is twice as heavy as 1.00 hank yard by yard, and they will be subjected to the same amount of drafting in the rollers.

The two ends run into the fine frame consist of the striped end 1.35 hank, containing two parts of color *B* and one part of color *O*, and the end of 1.00 hank of color *N*. As the 1.00 hank of color *N* is coarser than the 1.35 hank striped, there will be a greater proportion of color *N* than of the striped, for the coarser the number, the heavier it is also; therefore we get the following proportion:

1.00 : 1.35 :: 3 : X

1.35 × 3 = 4.05 ÷ 1 = 4.05 parts of *N*

The two ends run together on the spinning frame consist of the striped end containing two parts of *B* + one part of *O* + 4.05 parts of *N*, and the end of color *B*. As these two ends are the same hank it will be necessary to have the same amount in the solid color *B*, as there is in the striped end. In the striped end are two parts + one part + 4.05 parts = 7.05 parts striped. Therefore, we shall have to have 7.05 parts of color *B*.

SUMMARY OF PARTS:

2 parts *B* + 1 part *O* = Intermediate Roving.
2 parts *B* + 1 part *O* + 4.05 parts *N* = Fed into Fine Frame.
2 parts *B* + 1 part *O* + 4.05 parts *N* + 7.05 parts *B* Fed into Spinning Frame, which equals

9.05 parts *B*
1.00 part *O*
4.05 parts *N*

14.1 Total parts.

If we divide the total pounds of yarn required by the number of parts, it will give us the amount per part:

5,750 ÷ 14.1 = 407.8 pounds per part. Then
407.8 × 9.05 = 3690.50 pounds of *B* = 64.1 per cent color *B*.
407.8 × 1.00 = 407.8 pounds of *O* = 7.1 per cent color *O*.
407.8 × 4.05 = 1651.59 pounds of *N* = 28.7 per cent color *N*.

Total pounds 3690.59 color *B*.....64.1 per cent
1651.59 color *N*.....28.7 per cent
407.1 color *O*..... 7.1 per cent

5749.98 pounds.....99.9 per cent

Another method of figuring the problem follows:

12 yards of .50 hank color *B* weighs 200 grains
12 yards of 1.00 hank color *O* weighs 100 grains
Combined hank = 300 ÷ 2 = 150 grains.

150 grains = .67 hank roving fed to intermediate, which will contain two parts of *B* and one part of *O*.

The intermediate roving made is 1.35 hank. 12 yards of 1.35 hank colors *B* and *O* weigh 74 grains; as there are two parts of *B* to one part of *O*, this will consist of 49.3 grains of *B* to 24.6 grains of *O*.

This is doubled with one end of 1.00 hank of color *N*. 12 yards of 1.00 hank color *N* weighs 100 grains. Therefore the hank fed into the fine frame will be: 100 + 74 = 174 ÷ 2 (doublings) = 87 grains. And 12 yards weighing 87 grains = 1.15 hank.

12 yards of 4.00 hank *N*, *O* and *B* weighs 25 grains.
12 yards of 4.00 hank *B* weighs 25 grains.
25 + 25 = 50 ÷ 2 = 25 grains.
12 yards of combined hanks (*B O N*) and *B* weigh 25 grains, and 25 grains = 4.00 hank.

Therefore, the 4.00 hank roving *B* will be equal in parts to the combined striped 4.00 hank roving, *B*, *O* and *N*. This latter roving contains 100 *N* + 49.3 *B* + 24.6 *O* = 174 parts. Therefore, the 4.00 hank roving *B*, being the same hank, will also have 174 parts.

SUMMARY OF PARTS:

174 parts color *B*
100 parts color *N*
49.3 parts color *B*
24.6 parts color *O*

347.9 or 348 total parts.

Total parts of *B* = 174 + 49.3 = 223.3.
Therefore,

223.3 ÷ 348 = 64.1 per cent color *B*
100 ÷ 348 = 28.7 per cent color *N*
24.6 ÷ 348 = 7 per cent color *O*

99.8 per cent

Before closing I should like to make a remark in regard to the drafting arrangement on the frames. This is not requested, but I should like to know why "N. O. B." employs such a short draft on his intermediate and fine frame, and what are the advantages. In his intermediate he feeds one end each of .50 and 1.00, which gives a hank of .67. By producing a 1.35 he uses a draft of only (1.35 ÷ .67) = 2.

Our intermediates we feed two ends of .62 hank, making an equivalent hank of .31, and produce 1.25 hank, thus using a draft of (1.25 ÷ .31) = 4.

On his fine frame, "N. O. B." feeds one end each of 1.00 and 1.35 hank, which gives a hank of 1.15. By producing a 4.00 hank he uses a draft of only (4.00 ÷ 1.15) = 3.4.

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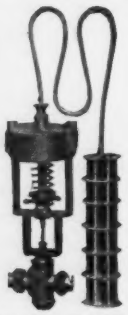

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Woolen cloth	☐	Knitting Hosiery	☐
Worsted yarn	☐	Knitting underwear	☐
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Canadian Representatives: **Darling Brothers, Ltd., 120 Prince Street, Montreal, Canada**

Our fine frames we feed two ends of 1.25, making an equivalent hank of .625 and produce 3.65 hank, thus giving a draft of (3.65 ÷ .625) = 5.8.

"N. O. B.'s" spinning draft is about the ordinary, a little on the short side, as he takes two ends of 4.00, equivalent to one end of 2.00 hank, and spins 18s. Thus 18 ÷ 2 = a draft of 9.

I do not say he is wrong, but I should like to know why he favors the short draft, or probably I've miscalculated—but I'm willing to make mistakes in order to learn.

N. F. (N. C.)

Some Figures on Waste.

EDITOR COTTON:

We are spinning 6s, 7s, and 8s yarn from cotton averaging about Middling, 7/8 to 1-inch staple. We are making about 65 grain card sliver, 70 drawing, 2.40 on slubbers, and 1.00 hank roving on speeders.

We are weaving heavy belting duck, 28.32 and 36-ounce, made from plied yarns running from 5 to 7 ply, from the yarns mentioned.

We generally figure on about 15 per cent waste. Last year our gross waste jumped up to about 16.3 per cent. We can account for part of this increase, but are interested to know what other mills, making the same type of goods, figure their gross waste. From waste sold, we can account for about 14.65 per cent of the total percentage of gross waste, which would leave about 1.65 per cent of invisible waste. We would like to know what percentage mills on our class of work allow for invisible waste. Following are the percentages of the largest waste items, and we would be pleased to see comparative figures from other mills:

Card strips	2.91
Filling waste, duck threads (mostly from looms)	1.81
Flyings	1.59
Card and spinning sweeps	1.58
Motes	1.43

Our bagging and ties ran 3.85 per cent.

We would be pleased to have, in "How Other Men Manage," such information as is available from other mills, and criticisms on the foregoing figures, and any suggestions which may be forthcoming relative to reducing waste percentage.

CONTRIBUTOR No. 3322.

An Oil-less Coning Arbor.

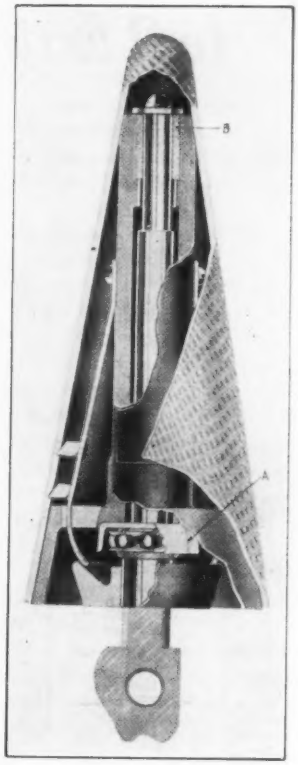
EDITOR COTTON:

The accompanying illustration shows a new invention which undoubtedly will be of interest to your readers who operate Foster winders. It is known as the Oddson oil-less coning arbor, and a glance at the cut will make its advantages apparent to the man who has been accustomed to the ordinary plain arbor.

It will be noticed at the point marked *A* there is a thrust collar and ball bearing, and at the point indicated by *B* is a wooden bearing, in the small end of the arbor, similar to that used on idler tape pulleys on spinning frames.

I saw this new arbor in operation in a Carolina mill, and some of the advantages as claimed for it is that the use of the ball bearing practically eliminates the use of oil on the coning arbors, thereby effecting a saving in the cost of oil, labor, giving a better production, and also avoiding the likelihood of oil coming in contact with the yarn on the cones.

The application of the ball bearing in the arbor relieves the friction, thus reducing slippage and eliminating any cones becoming stuck, which to a large extent will effect a more perfectly wound cone, eliminating the necessity and cost of re-winding faulty-wound cones, it is pointed out.



Furthermore, it is explained, old arbors and spindles which have become worn out and discarded can be reclaimed for indefinite use by fitting them with this new improvement.

The device, I understand, is patented by Todd & Wilson, Box 118, Gastonia, N. C. It was invented by F. C. Todd, superintendent of the Ruby Mills, Inc., Gastonia, N. C.

BOB (GA.)

Causes for Uneven Roving.

EDITOR COTTON:

This is in reply to the inquiry of "G. D. S." regarding thin places in roving.

I note he says the thin places are at different lengths and are not regular. Offhand, I should say that his trouble is in his flyer pressers and tension. He probably has been running different hank rovings, and when going onto finer work did not close or open the pressers and flyers. I would recommend that he get an expert flyer balancer and have all the flyers balanced, re-blocked, and the pressers set, on one roving frame, and then run a test of this roving and see the result. When pressers and flyers are not set correctly for the hank roving being run, it is impossible to get an even tension, and since the stretch comes between the

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flyer presser and the bobbin it cannot be detected until the roving goes onto the bobbin. Surely if these thin places are caused on some preceding process or by bad roll setting or drafting, or any cause above the flyers, "G. D. S." could see the thin places coming through between the front steel roll and the nose of the flyer, and his frames would not run so well as he says they do.

Too much twist is not good for roving, but too little twist will cause the roving to stretch in the flyer and give the trouble that "G. D. S." speaks of. No longer than last year, our spinning was going along fine, and we undertook to take out one tooth of twist on the fine frames, but this certainly gave us trouble and we immediately changed back.

Dry spindles and bolsters will make thin places on fine frames, but this would be detected by bad running work, and I note that "G. D. S." says his work runs well on the fine frames.

If he has given us the facts in the case, he must be getting these thin places between the nose of the flyer and the presser. Otherwise he could trace the trouble back.

If these suggestions do not give him relief, if he will write again I will go into the problem more in detail. Ask him to be sure his trouble is not on some former process. It may be that some certain frame hands are taking up on the tension rack, tightening ends, or he may have some fine frames on which the cone belt does not wind back far enough when the frame doffs, which would cause the roving to be stretched. Maybe his cone belts are in bad condition, and slipping, or maybe his bobbins are not all of the same diameter.

I have tried to outline some possibilities after the roving leaves the front roll. Tell him to take one frame and first try a tooth of twist and test this on the spinning. And if this does not work, have him check the other items one at a time. A day's concentration should prove whether the trouble is on the fine frames or elsewhere.

L. M. (N. C.)

EDITOR COTTON:

In answer to the question as to the cause of uneven roving, as stated by "G. D. S.," I should say he might trace his trouble to the opening room. If he is using different lengths of staple, from 7/8-inch to 1 1/16-inch, he will find that these cottons will not draft evenly together. He should, if possible, run a uniform staple, and it is not good practice to mix compressed and local cotton together unless he has sufficient opening machinery to thoroughly open and make the compressed cotton lively, or, I would suggest that the compressed cotton should be aged before running into the mix.

In the picker room the fan speed should be sufficient to draw the cotton evenly to the screens. He should see personally that all the card settings are correct.

If the drawing rolls are speeded too high it will cause uneven drafting. All bearings on the drawing rolls should be free from black oil, as this will cause the rolls to jump.

The rolls on frames should be set so that the break draft will be even. "G. D. S." should see that all the middle leather rolls run the same speed, and that each roll is drafting enough to tear up the twist in the stock that is being received. This should be done on all the roving frames.

I believe that "G. D. S.'s" trouble is too much twist in all his roving processes, and that the rolls are unable to draft the over-amount of twist, and that this is the cause of the thick and thin places in the yarn; also that is probably why his work runs good in the speeder room and bad in the spinning. He should put just enough twist in to make the stock run at the next process without breaking or stretching, and see that the tension on all fly frames is correct.

BOB (S. C.)

EDITOR COTTON:

This is in response to "G. D. S."

Thick and thin places are due to frictional contact of the front roll. There are three causes: (1) the number of fibers in the cross-section being excessive or, in other words, the sliver from the card or drawing being too heavy: (2) the first and second rolls being set too close; (3) uneven staple.

First let us consider what takes place when the strand is too heavy. The excessive amount of fibers form what may be termed a bedding for the preceding drawing or top leather roll, and of course its action depends on the drawing power of the front top leather roll. Now, picture in your mind if you can, what may happen when the second top leather roll is riding on the fibers only. Is it not reasonable to assume that the front roll will pluck or draw the fibers in clusters, which of course is what happens, and although the defective places may be from ½ to 1 inch, the draft in the preceding process makes these places longer in proportion to the draft. This is one thing that will form the thick and thin places found by "G. D. S." in his card room.

Next, let us consider what happens when the front and second rolls are set too close. He may be running a very light sliver, but if the front roll is retarded by a close setting, the second roll having freedom to revolve at all times, forms what may be termed a "slub" or "bunch," but with the fibers parallel. When such work is delivered by the front roll, the stretch caused by the retardation of the front roll, which occurs between the surface of the bobbin and drawing rolls, also forms thick and thin places, but longer in length.

Next, let us consider the trouble caused by uneven cotton. In such a case we have a combination of the two, for the reason that the fibers do not follow or pass one another the same as with even stock, and the short fibers ride in clusters, and the longer fibers cause the front roll to retard, and as stated, we have a combination of thin places as described in the first two cases.

The latter case is by far the worst, and remedied only by self-weighted rolls.

If "G. D. S." reads every issue of COTTON, he may have seen an article written by me in which I confessed that the deplorable conditions of a mill in this state due to a very heavy sliver was the cause of my coming here.

I found thick and thin places by the thousands. For the benefit of "G. D. S." and others I will explain the changes that I made, which caused the thick and thin places to disappear.

First, I reduced the card sliver from 66 grains per yard to 56 grains. Then I reduced the drawing sliver from 82 grains to 55 grains; the slubber hank from .46 to .60, and the intermediate hank from 1.25 to 1.40. I speeded the doffers on the cards in proportion and also the front roll

Increased Production

The treasurer of a representative Southern mill says: "Some time ago we attached Root Pick counters to our looms, which we believe has a remarkable effect upon our weavers. They now run the looms during the noon hour, and sometimes turn them up before starting time, and keep them running after quitting time. This is the principal cause of our increased production."

Better Production

The weaver knows that an occasional kick will not give him a cent's worth more in tonnage. In this way a more uniform and standard piece of cloth is made, so there is no incentive to kick the pick which causes thin places. This permits you to positively guarantee the uniform quality of your cloth, and that alone is worth the price of the counter.

Exclusive Advantage

The advantage over "cut mark" or "yardage" method of paying with its uncertainty of guessing and estimating is entirely eliminated when you pay by the pick. The counter has recorded all picks woven and the weaver can be paid any time without loss to himself or to the company. It settles disputes which arise over pay as the weaver can check his week's wages at any time.

Promote Harmony and Satisfaction

Payment by the pick rewards the workman for the actual amount woven—weavers leaving you can be paid off immediately—accurately—no argument between the crews of day and night shifts is possible.

In each of the above there is a decided extra benefit in permanent harmony and satisfaction among your weavers—it is showing them square treatment.

The Census Takers of the Textile Industry

Incentive to the Weaver

By being able to check his week's wages and knowing what it is at any time, the weaver becomes more interested in his work knowing that he is to be paid more for increasing his individual production. And again no weaver wants to be classed as the poorest workman, so he will exert himself to the utmost in order not to be shown up by his fellow weaver—for payment by pick the Root counter way places them all on a strictly competitive basis.

A NECESSITY TO QUALITY PRODUCTION

ROOT COUNTERS —in the Textile Mill

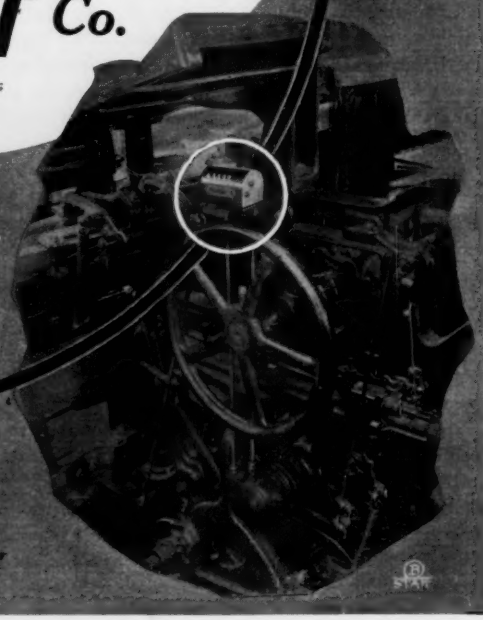
ELIMINATES ALL CHANCE OF KICK

Efficiency and Economy in the Textile Industry, as in every industry, depends upon modern Equipment. But why limit that equipment? No present day business would consider doing away with the adding machine. Remember the adding machine starts where the Root Automatic Pick and Hank Counters stop—why not use accuracy from the beginning? To count correctly raw materials and Individual Loom Production and Individual output of each weaver, is the only method by which production costs can be attained from start to finish.

Our Engineers have successfully overcome the obstacle of vibration which heretofore has caused so many otherwise good counters to fail. Direct connection to the moving part of the loom had short life, likewise the flexible shaft, so after much research work they hit upon a plan of attaching a counter to the loom frame and drawing it by worm and gear from a cam shaft through two universal joints and a connecting rod, which has proven to be the most dependable way possible. See illustration below.

THE EYES OF PRODUCTION

KEEPS THE WEAVER AT HIS BEST



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speed of the slubbers and intermediates. The rolls on the drawing were spread from 1¼ to 1½ inches. The length of the staple run was 1 inch, and the type of rolls metallic.

On the slubbers, the drawing rolls were spread from 1⅛ to 1 3/16 inches. These settings refer to the first and second top leather rolls.

The only change made on the fine speeders was in shortening the draft. WASH (R. I.)

EDITOR COTTON:

"G. D. S. (S. C.)" certainly has some problem before him, I'll agree, and I certainly do not envy him in the least. There aren't very many definite suggestions given in his letter for us to work upon to assist him, with the exception of the statement that he is running 7.00 to 5.30 hank roving, and that there seems to be thick and thin places eight to ten inches apart.

In the first place, the thick or thin place surely must be made previous to the finisher or fine speeder, for if he is making 7.00 hank from 1.40 hank, the thick or thin place coming from behind the fine frame would be extenuated ten times its length, and in the case of the 5.30 hank, with the same roving at the back, the same thing would occur except the thin or thick place would be in the neighborhood of eight inches apart.

This then is of course a matter of a trouble in a preceding frame, overdrafted at the fine frame; or, in other words, there is a possible chance that his energies are being spent upon the wrong machine. For instance, if there is an over-abundance of twist in the intermediates, and the rolls in the fine frames are not set to handle such conditions, there is no setting or adjustment in the world that will relieve the uneven places until the twist has been removed from the roving coming from the intermediates.

This twist proposition is a life-saver for a carder, but it is Hell for a spinner. I say: take out the twist until it hurts and then try to handle that hurt condition by slowing down the frames on which twist has been removed. Nothing is lost, for the front roll is turning off extra hanks, and a man certainly can afford to reduce the speed until that front roll turns at the speed at which it previously was running. No production is lost, and there is a big chance of gaining a tremendous lot of comfort. Too much twist usually tells of its trouble in thick and thin places in yarn, and shows us how hard it tries to run good by grooving all the leather rolls that it comes in contact with, especially if the traverse motions on the fine speeders are not throwing the roving guides past the intersecting traverse point on the surface of the leather roll. Uneven surfaces on leather rolls, especially if there isn't much cushion beneath the leather, certainly doesn't help to make even yarn. "G. D. S." should see to it that the leather rolls have a good cushion, and a straight surface; he should let no hollow-surfaced roll run on any machine, nor a hard one, for if he does he should invest in a lot of cast-iron and attach it to the weighting of the leverage on his rolls. This creates more wear and tear and uses more horsepower and patience. Get away from it, I say!

Now for a little summary: Less twist, less speed, soft rolls, true rolls (leather). Then the rolls should be so adjusted that they actually draw the sliver and do *not slip* upon the surface of the sliver. I suggest that "G. D. S." try setting the two front rolls, or rather the first and second rolls, 1/16th of an inch over the actual length of the longest fibers run, and stick to that setting on every machine in his care; and then slide the third roll back a little at a time until he discovers the distance where, by placing a ruler upon the sliver between the rolls, he can feel the stand give away beneath it.

When he has found the distance between the rolls that allows the bulk and twist and length of staple to give way under pressure of whatever he uses upon it, then and there he should tighten the stands and get the best results. But first he should remove all hard-twisted slivers or slivers with hard cores or centers. These settings apply to every machine in the mill.

Now there is the question of tension which must next come in line for criticism. If we could determine a tension on the frames that would remove all possible worry from one year to the next, we certainly would give it consideration. Well, how about trying this: If the twist is 3.00 turns per inch actual, move the decimal point one place to the right (30.00) and call that figure 30 *lays* per inch actual upon the surface of a bare bobbin. Find a lay gear that gives exactly 30 lays per inch, start the cone belt upon the extreme small end of the bottom cone, adjust the first layer of roving on the bare bobbin either with the cone gear or by moving the rack slightly, to insure against a tight or slack tension. Then find the rack gear that allows the frame to let out at each change the exact amount. Watch one complete set of roving, get all these conditions right and the tension troubles stop.

That tension difficulty is probably a part of "G. D. S.'s" thick and thin place troubles. If he allows an eighth of an inch of stretch to take place in any process, he will find that eighth of an inch drawn into a great many inches of this yarn. I know of instances where with three processes of drawing I have removed nine teeth of tension. These are the trifling things that bring gray hairs to the carder's head.

Another place in the process of manufacture where thick and thin places are created is at the point of the trumpet on a drawing frame. For instance, if you are running 1-inch cotton and say somewhere in the scope of 50-grain sliver there is an action upon the drawing sliver that most men call condensing, you will readily see that from the time any part of the 50-grain sliver starts into the small hole in the trumpet there is a drag upon that part, or a retarding action takes place from the very fact that the rush of crowded fibers are struggling to shape themselves into the form of a pin, so to speak. From the top of that condensing point to the base may be ¾-inch in length, then from the base of the trumpet to the bite of the calender rolls may be another inch. So if you can see the possible chance of a heavy sliver being dragged through a tiny shaper (called a trumpet) whose upper edge is at least 1¾ inches away from the pulling power upon that heavy sliver and especially if the cotton used is 1 inch in length, isn't there a great chance for that sliver to be pulled apart as any part appears through the lower edge of the trumpet, and if there is a slight stretch there, what will draft do to those stretched places? The answer is thick and thin yarn.

Then there is always the possibility of over-drafting short cotton and bulky slivers. This is a general cause for complaint, so I should say to "G. D. S.," see to it that the drafts are normal, remove all tensions, arrange the

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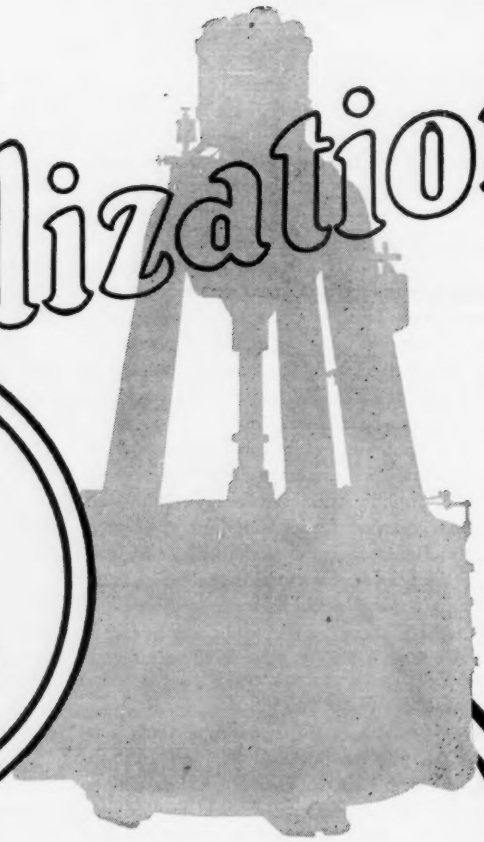

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trumpets to remove the drag and possible stretch, get soft leather rolls, take out all possible twist, slow down machinery where possible, attend to the traverse guides on the roving frames, get the tensions right on the speeders, and finally—if I were he—I should use a long-drafted card to soften the sliver. A. B. C. (R. I.)

Finds Too Many Knots.

EDITOR COTTON:

I should like to see in "How Other Men Manage" some opinions from men who know from experience what is the cause of great showers of spooler knots coming up in the weaving. I mean by this that knots come up on the warps in the weaving so thick that we can count from two to five dozen knots from around the loom beam to the fell of the cloth. This sometimes continues for several days. How can this condition be remedied? S. K. (N. C.)

Finishing Olive Tan Drill.

EDITOR COTTON:

I am sending you a small sample of 37-inch, 3.25-yard drill, 68 x 40, dyed olive tan, to be finished 34-inch. I would greatly appreciate any information you may procure through "How Other Men Manage," with reference to the following problem:

Firstly, these drills have to be finished 34-inch, and must be returned to the customer, after dyeing, etc., the same weight as they were received in the grey, and must have the same feel, or as near it as possible, as the sample. I have tried various ways, but without success, as the shade was dyed with a direct color and it is only certain things you can use in the starching, otherwise the shade is affected. I have been starching them on a two-bowled mangle with an immersion in the dope, then through the nip, then onto six cans and through a hot air tenter, then cool off and yard off. Any information you can secure will be appreciated.

CONTRIBUTOR NO. 224.

EDITOR COTTON:

The question relating to the 37-inch olive drill, a copy of which was submitted to me in advance, is noted. The change in finishing as regards the olive colors is due largely to the goods being finished in the dyehouse in an alkaline bath instead of in an astringently acid bath; this may be added to the dyebath if so desired. The goods should be dyed on a two-box machine sewed together in 1,500-yard lengths as they come from the bale. The first box should be made up something like this:

12 ounces	No. 1332 brown.
6 ounces	Black
6 ounces	Orange
4 ounces	Brown G
6 ounces	Sun yellow
4 pounds	Softener
20 pounds	Glauber's salt.

Making, with boiling water, about 16 pails altogether. The second box should be made up of one pail Sumac extract warm only—chestnut or any other astringent will do—16 pails altogether.

The stock tubs should be made as follows (dyeing tub):

2 pounds	No. 1332 brown
6 ounces	Black
6 ounces	Orange
4 ounces	Brown G
8 ounces	Sun yellow.

and the stock tub for the astringent (or Sumac) made from one pail of extract, 16 pails of water.

The goods are run once through both dye and astringent, once freshening up with one pail of dyestuff from the stock tub and one pail of astringent from the stock tub. Run twice, and for the second run use two pails of the standard dye, two pounds softener, and five pounds of Glauber's salt, in the first box (added to dyebath) and use one pail of stock tub (astringent) on second seam, and in the beginning of every run; continue this indefinitely for 40 bales if necessary. Each two seams are supposed to represent about 120 yards.

Mangle without water and dry upon trucks.

Starch the same as given and run on rolls one bale (say 1,500 yards) and dry as suggested, etc. Starch about four pails, water about 250 gallons; Monopole oil, or other softener, about ten pounds; and bring weight up to requirements with Glauber's salt, say about 300 pounds. Starch, water, and Glauber's salt added cold and boiled up; the softener (Monopole oil) is added after boiling and well stirred in. W. B. (MAINE)

To Prevent Stretched Laps.

EDITOR COTTON:

A lot of the trouble carders have with soft, puffy laps that split easily, is due to the little rollers in the lap heads being stuck, and not to bad fan draft or condenser screens.

The lap rod on which the lap is wound as it comes from the vertical calender rolls is turned by the pull of the lap as it is rotated by the fluted rolls at the bottom. Unless this rod turns very easily it takes enough pull on the lap to distort and stretch it before it will turn at all. The thicker the cotton gets around this rod, the softer it is, and the more easily stretched. So if the lap rod is sliding on the rolls instead of turning them freely, there is sure to be too much pull on the surface of the lap for its own good.

Any stretch in the lap before it passes over the fluted rolls will stay in, and the lap gets spongy and puffy, making it hard to handle without falling apart, and also making it lick up and split when run on a card or a picker apron.

Any trouble caused by these lap head rollers being in bad shape can be remedied by the use of ball bearing rollers, which can be bought from the manufacturers all ready to put in the heads. These rollers only have to be greased once or twice a year, and you get rid of the oil that usually runs down out of the heads on to the lap rod, where it soils the tender's hands and gets wiped off on the selvage of the lap when it is lifted to the floor. The ball bearing rolls are greased with the same kind of an arrangement used on an automobile, where the grease is forced in through the pin on which the roller is mounted, so that it only takes a few minutes to grease all the rollers in a good sized picker room. One of these ball bearing rollers will never stick or hang up, and they turn so easily that there is no danger of stretching the lap.

By using these you can make a good, tight lap, and sometimes with less friction on the let-off than you have

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thought necessary before. The less friction you can make a good lap with the better for the lap. Excessive pressure on the lap will often stretch it by making it bulge down between the two fluted rolls under the heavy pressure from the lap rod. This bulge will result in permanent stretch that will make spongy laps. Free-turning lap head rolls, and a moderate friction will make laps that are firm and compact, and that will not split or lick up.

There are two rollers in each lap head. The bigger one takes most of the load, so it does not make so much difference what becomes of the smaller one, except that if it does not turn at all a groove may wear in it and let the rod get too much off-center on the big roller. The big one is the place ball bearings are needed the worst.

C. H. (Mass.)

Following Up the New Man.

EDITOR COTTON:

For some time I have intended writing to tell you of my appreciation, as a superintendent, for the serial discussion on "Human Relationships in Industry." The article on "The Follow-up" and "Rating Help" brings to mind many thoughts, so I shall discuss this particular installment of the series.

"Following-up" an operative is a very essential thing, whether he be an old experienced worker or an inexperienced one. The experienced one (that is, one employed from another mill) may know how things are done where he came from, but this may not be the custom at your plant. The things he does might not turn out as they did where he formerly worked. We too often take for granted that he ought to know because he's an experienced operative, but such is not always the case. There are quite a lot of different little kinks here and there that a mill is keyed up to and the machinery set up to, which, if worked differently, would cause trouble. The man at the mill might not detect it, but the buyer who examines the products very minutely will notice the result of the error, and then the mill is in for it. The buyer doesn't know just how much is coming this way, and he has to satisfy his customers. You know about the scrutinizing eyes of some of the old ladies or even the younger set. If there is anything wrong they will detect it. They generally make a tour of inspection before they buy a piece of goods; in fact, they look over everything on the shelf and then bring another "inspector" with them when they do buy. If there's much complaining it gets back to the selling agents, and then to the mill, and then to the department.

So it pays to "follow-up" the operative until he understands those things which satisfy the customer. I have had the pleasure a great many times to talk with buyers, and they are very "touchy" in their dealings and talk about the small things. Often we'd think they would talk of big things, but it's the simplest sort of thing they're interested in. After all it's the old adage, look out for the small things and there will be no big ones.

Now, the inexperienced operative should be put with one of the best operatives—one who is not only a good operative; but who has the knack of explaining in a way to be understood, for an order, or advice, is never completed until the one to whom it is given understands the thing just as the one giving it does. Consequently, the teacher must

be able to make them understand as quickly as possible—and in doing so must see that the new one doesn't get out of heart on the new job nor lose interest. Once they get sore it's hard for them to see any further, and they will have to be put with someone else, and that brings up the question between the two, that is, between the teachers. "What? Why did you leave the other one and come to me?" or they will ask the overseer, "Why bring him to me? Bill's as good a frame hand, or weaver, as I am. There must be something wrong with this new guy?" It is a very particular thing, and should be followed up very closely every day until the man can take work by himself and then the overseer, or section man or second hand, or better still, the overseer, should drop around his way and keep him posted and encouraged and explain just what is required on his particular job.

Then, his rating should be watched and should follow closely with his education. He should never be allowed to think he is not being paid what the job pays. Many a time this has caused no little confusion. They invariably think they are not getting it fast enough anyway, whereas the mill has lost money teaching them; but they never think about that part of it. It's all new to them and they take it for granted that it's coming to them.

Following up a new operative, and an experienced one, is a great factor. It means a better, safer organization. The defects are seen quicker and are more easily remedied. Everybody stays with his job, and this means quality and quantity.

Mr. McLaurine hit the nail on the head when he said that the two subjects can be discussed together and should bring to the mind of the overseer the necessity for certain fundamental ideas in the discharge of their duties.

COTTON'S readers should read this man's articles in every issue, and then file them away. Then when a man thinks he's got his job where it is on top, and walks through his room and can't find anything hardly to improve on, let him hunt up just any old copy and read Mr. McLaurine again, and he'll find "oodles" of them.

Some people scorn magazine and newspaper articles, but a fellow can get good out of them providing he puts something into them. If a man is one of those fellows who don't put anything into the thoughts of these articles, and can't get interested in reading them, he had better get him up a peck of peas, and a donkey of some kind and have him ready, for he is next on the shelf, and he's asleep and just ready to roll off. CONTRIBUTOR NO. 14.

Organic Mordants.

EDITOR COTTON:

Organic mordants are used more or less extensively in the dyehouse, and for the benefit and interest of those readers in this line of work, I will outline as best I can just what these are, so they will have a better knowledge as to their application with colors.

Setting aside the astringents, the organic mordants may be referred to as two classes—albuminoid substances and their kindred, and, second, oily and fatty bodies. Substances belonging to the former class have been very extensively used by printers for fixing upon cotton the aniline colors, archil, picric acid, and other dyes which have but a feeble affinity for that fiber.

The action of these substances is totally unlike that of the mineral mordants; they have a very strong tendency to combine with the coloring matters for which they are employed; but to the fiber they merely cling in a mechanical manner, forming a coating, like paint or varnish over its surface. The matter that is really dyed or printed is not the cotton, but the thin film of albumin which has been deposited upon it.

The principal mordants of this class are albumin, derived from eggs, from blood, or from the roe of fishes; casein, or, as it is improperly called, "lactarine," and gelatine. Gluten, or vegetable fibrine, along with other substances of an analagous nature, have also been to some extent applied.

All these bodies agree in being highly nitrogenous, but there is no indication that they transfer any nitrogen to the cotton fiber, or exert any chemical action upon it whatever. As I have already stated, they merely infold it in a layer of matter, which, in its relations to coloring matters, resembles wool or silk.

Sulphur, in a state of organic combination, is doubtless present in albumin, casein, etc., just as it is in wool. Nevertheless, as it is absent in one body, which is perfectly capable of acting as an "animal mordant," the theory that such sulphur is the essential element upon which the affinity of aniline colors for the fiber depends cannot be exclusively correct.

The use of nitrogenous organic mordants is less extensive in dyeing than in printing. In piece dyeing there are great difficulties in applying these mordants to the goods with evenness and regularity, and, consequently, though beautiful shades are obtained, they vary in depth in different parts of the batch.

In one department of cotton dyeing and printing, the Turkey red process oil serves as an assistant mordant, and cannot so far be dispensed with, although the rationale of its action has not been discovered. The kind of oil used for this purpose is Gallipoli, which, to be fit for use, must be capable of forming an emulsion or milky fluid when agitated with a weak solution of pearl ashes. The oil should not begin to separate out from this emulsion for a period of at least 24 hours. Rape, linseed, nut and poppy and castor oil is largely used also for this purpose.

W. B. (MAINE)

Fly Frame Methods and Points.

EDITOR COTTON:

After having read Mr. Soniaman's article on fly frames in the November issue of COTTON, I have decided to write a few lines myself, which might interest some of the readers of COTTON.

The eternal cone belt problem, as Mr. Soniaman puts it, can be solved by the use of a cone belt such as he describes. In a certain mill a test on cone belts was made and a belt of this type that was put on four years ago is running today, and will probably last another four years or more. The rubber cone belt is also good, but not as good as the one described, although the first cost is much cheaper.

Tension is another question of interest. We all know that too much tension stretches the roving. All the tension that is necessary is enough to keep the ends up; the less, the better, I think.

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DATE Dec. 1st 1924 MILL NO. 1

NO 96

FRAME NO: 10

Has changed from 6oo hank Eg. Quality to 9oo hank Eg. Quality

Twist Gear

NAME: Section hand

How to tell when you have enough tension is another question. My answer is that if you see a frame with all ends jumping slightly up and down the tension is ok. If the ends run evenly you have too much tension. Who should regulate the tension? I believe that the section hand should be capable enough to know whether his tension is right or not. I do not believe in changing the tension gears only when the hank or quality of cotton is changed. If the tension becomes too tight or too slack, it can easily be adjusted by moving the cone belt on the cones by means of the slide in the cone belt fork.

In a certain mill the doffers have to doff on four frames. These frames doff four and three times daily, alternately. The doffer cleans the spindles three times a week, and the backs at the same time. The doffer must also clean all clearers after every doff and wipe all the rail boards and back boards at every doff. If a doffer shows up good at doffing she is given a chance at spare-handing when there is an opening, and while spare-handing she is given a chance to run frames when a tender is out. If a speeder tender leaves, the spare-hand, if capable, is put on the frames.

In the mill I am connected with there is considerable changing over done from different hanks and qualities of cotton to some other hanks or quality. When a change is necessary the assistant overseer gives an order (written) to the section hand to make the change. Over the section hand's bench is a glass frame containing a compiled list of all the gears for all the different hanks and qualities. When the section hand has changed the frame he makes out a slip, printed for the purpose, recording the change, a carbon paper between two slips makes it so he gives one slip to the sizer who immediately sizes the frames, and the other is given to the clerk who records it on the hank sheet. A form used for this purpose is shown in the accompanying illustration.

In the care of the fly frames and the cleaning of same there are many suggestions to make. Some mills may be bothered with clogged bolsters, if the doffers when cleaning the spindles would run their hand downward on the spindle instead of upward, as some have a tendency to do, they would not push the waste up into the bolster and there would be less clogging. Another cause is when the speeder tender is oiling the spindles she should take care that there is no waste around the top of the bolster, as if this becomes oil soaked it will work down into the bolster and clog it.

Top rolls should receive periodical care and the tender should be extremely careful not to put too much oil on the rollers. A non-floid oil should be used. On Sakellarides cotton flyers should be cleaned at half bobbin and again at doff.

W. O. R. (MASS.)

Caring for Combers.

EDITOR COTTON:

In the comber, as in other machines, certain parts must be oiled, and the needles on the half laps should be examined often. All those which are found bent or crooked should be straightened at once.

In a mill where every delivery must be kept in operation at all times, there should be extra half laps, so that if there are too many needles on the half lap bent or broken, the machine will not have to remain idle during the time that a half lap is being repaired.

All parts of a comber should be taken down and given a good cleaning, and such repairs made as changing the half laps, renewing the brushes, re-covering the doffers and repairing the condensers. Re-cover the cushion plates about twice or three times a year.

The half laps should have the waste removed from their bristles about every two or three weeks. The top combs should also be examined very carefully. If the needles are bent or crooked in any way the work will have a stringy appearance on account of the cotton passing through the comb not receiving a proper combing.

The leather detaching roll must at all times be perfectly true and should be varnished every week, because the condition of this roll has much to do with the quality of the yarn. Any defects of the leather detaching roll will cause thick and thin places in the web.

All the polished parts of a comber should be cleaned and polished once a week. The comber fixer or second hand, should look at each web often and examine the different settings while passing the comber, for if there is too much pressure on the nippers the nippers will pound and in a little while destroy the settings. On the other hand, if too little weight is used, it will be seen that many long fibers will be drawn and discarded as waste and an uneven sliver will come through.

The proper care of the lap has also much to do with the saving of many a top comb. The machine hand of a

sliver lap machine should not be allowed to twist the sliver in piecing. The comber hand should take good care in putting on a new lap and see that it is not doubled at the ends. The lap should be broken back and a new lap put on before the end leaves the spool, as it will be sure to double up before it is drawn through the feed roll and spoil the top comb. Everyone knows what happens when the tail end of a lap goes through the card and how the card hands are cautioned upon the evils that will result. The same holds good here upon the comber, because the combing parts of a comber are still more easily damaged than those of a card. In the comber, as on the drawing, if an end comes down or breaks on the table or in the pans, like a sliver breaking from the delivery of a drawing, it makes the resulting sliver too light.

When a sliver is pieced up, the defective one, that has been delivered into the can for the period that the end was broken, should be taken from the can. The amount of waste may be increased by feeding later or by closing the nippers later or by setting the top combs at a greater angle or by setting the top combs nearer the fluted segments. Curling is made because the leather rolls are badly covered or not varnished as they should be, or dry for oil. The lining may not be right or the top rolls may be out of place or not weighted correctly.

The production of a comber is generally obtained by breaking the ends at the coiler and running the comber for say a minute. Then the end is again broken and the amount weighed. Multiply the weight delivered in a minute by the number of minutes the comber is run and divide by 7.000. A certain per cent is allowed for stopping, and this varies according to the number of comber hands and the delivery of the comber. However, about five per cent is generally allowed. We seldom see much said about the comber, and as we are now in a fine yarn age "down South," so to speak, would love to see a little comber discussion coming along now and then. "BAB (N. C.)"

Overcoming Weaving Troubles.

EDITOR COTTON:

In answer to the question of "Pine Tree State (Maine)," which was referred to me, I will say that there are several things that will cause the filling to knock-off. One cause is the shuttle being checked too suddenly in the battery end of the loom. The loom may be run with the minimum amount of power, and still the shuttle may be checked too suddenly. This may be caused by the check strap being badly worn, or an improper setting of the check strap.

My way of setting a check strap is to push the picker stick back in the end of the lay with the shuttle, then set the adjustable slide casting as far forward as it will go, and then adjust the check strap so it will be almost tight against the picker stick and the front end of the adjustable slide. This will give better service and more of a gradual check to the shuttle than any other setting I have found.

The binder spring being a little weak will sometimes be the cause of the shuttle being checked too suddenly.

Another thing—the point of the quill must be exactly in the center of the shuttle. The point being too high or too low or too far to one side will not allow the filling to be drawn off evenly. Care also must be taken to insert the bristles in the shuttle so as to give the same tension on the filling both on the top and the bottom of the quill.

Another thing that will help is to have the shed open as wide as possible, and to have the shedding cams set a little late; that is, set the cams so the harnesses will be level with the crank shaft 1½ or 2 inches past the bottom center. This gives the shuttle a little more time to pull all the kinks out of the filling before the shed begins to close up on the filling.

After trying all of these ideas, if they do not produce results, the next thing is to enlist the cooperation of the spinner. This trouble sometimes can be caused by a defective starting and finishing of the bobbin at the spinning; or it may be caused by too much twist in the filling. But I think it best for a man to exhaust every possible means before he lays the blame on the other fellow; in other words, "Be sure you are right, then go ahead."

I would like to read more answers to this question, as this is a pretty mean problem to handle sometimes.

JACK (TEXAS)

EDITOR COTTON:

In response to "Pine Tree State," who first says he is having trouble with filling knocking off and weaving in on the small end and also on the barrel end of the bobbin on wide looms, I would suggest, first, that he see that his checks are in good shape. It takes an especially good check on wide looms. Then he should see that the filling is made with the ring rail going down fast and up slow, and should see that the ridges on the bobbins are right. A regular Draper quill should be okeh. If he will have the bobbins made as stated, and tightly wound, this, together with good checks, ought to do it.

He says he is having trouble with the new crop of cotton. Although it may be bought for 1 1/16 to 1⅛ inch, the new crop has a tremendous amount of short staple stuff in it, and it may be that "Pine Tree State's" spinner is nursing his end of it to the detriment of a good wound bobbin.

As to taking the selvage strings off of a cut of cloth from the loom, I do not know of any device or machine for doing it, but my method is to use a regular gasoline blow torch and singe the rolls as they come from the weave room. I have a stiff brush or a card clothing brush with which we brush over the end of the roll, and we singe off the loose ends. It works perfectly, and there is no danger of fire if ordinary care is used. K. L. (GA.)

Causes for Stretched Roving.

EDITOR COTTON:

Some men claim that stretched roving is an evil caused by the imperfect construction of the fly frame on the part of the builder. I for one say that this is not due to this, but to improper care of the machines, as regards cleaning, oiling, repairing, and humidity.

Stretched roving can be caused by the poker bar and taper gear collecting waste, causing them to bottom. They will run in this condition for hours before it becomes known to the section man. This means the cone belt will not move as far as it should move, and possibly will wait until the carriage has made half a journey up or down. Some section men clean, oil and regulate this point while others

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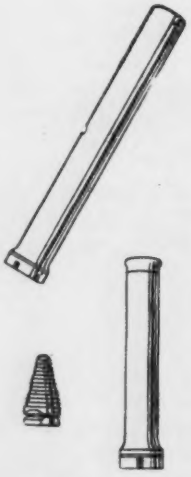

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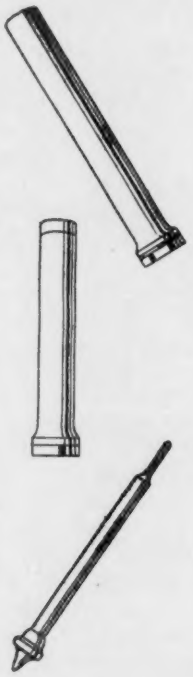

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will place extra weight on the weight chain in order to force the letting-off. Using extra weight is not a very good practice because all the weight necessary was placed on this let-off motion when it was made, and any added weight causes wear on the pigeon or wing brackets. It also will cause the frame to make tangled roving, called runovers, due to the ratchet being held too tightly against the ratchet stop pawls which, from actual experience, proves irregular changing of the carriage is the cause; or the coils on the ends of the bobbin are mislaid, resulting in rough-ended bobbins which cause much difficulty at the next process. Don't misunderstand me. All mills don't allow these things; but some of them do.

Another point that doesn't receive the proper attention is the pitch of the gearing. Some men seem to think that so long as a gear has the same number of teeth in its circumference it is all right, regardless of its size. However, this is untrue; the size of the gear is as necessary as the number of teeth. If they are not of the proper size there will be unnecessary wear—I have seen all the ends cut down on the frame, and the section man and overseer could not find anything wrong, and would satisfy themselves by saying the operative caused it when cleaning. However, experience and examination of the draft and back roller gears proved the gears were not of the same pitch, and that was what caused the trouble. I know of mills using draft gears of 27 teeth each and a difference in their circumferences of more than a half an inch, while there are back roller gears being used with more than an inch difference in their circumferences, although they had the same number of teeth. The gear with the wrong pitch tries to ride the gear having the proper pitch, causing both gears to become unnecessarily worn.

With reference to humidity and temperature, science tells us the air will not contain as much water at a low temperature as it will at a higher temperature. Science tells us if at 16 degrees Centigrade or 60.8 degrees Fahrenheit the air can contain 13½ grams of water per cubic meter when the air is fully saturated; but if the air at this temperature contains only 6.75 grams per cubic meter, the relative humidity is 50 per cent. Here is the way I figure actual humidity, and if I am wrong will appreciate some reader's correcting me:

Wet bulb reading, 60.8 degrees F.; .88 × 60.8 = 53.50 degrees, wet bulb reading. 53.5 × 13.5 = 722.250. 722.250 ÷ 60.8 = 11.88, actual humidity or water in air. 11.28 ÷ 23.50 = 90.22 per cent relative humidity, or a depression of 6.3 degrees.

I do not know how to figure humidity from the depression; however, good results are obtained from this calculation. The amount of water the air can contain depends on the temperature. At a temperature of 50 degrees F. the air will be saturated if it contains 9.33 grams of water per cubic meter. While in the foregoing example the air could contain 13.50 grams of water per cubic meter, and a difference of 10.8 degrees in temperature. Therefore, humidifiers should not be allowed to put out as much water with low temperature as with high temperature.

T. A. A. (S. C.)

T. C. BENTLEY has been made superintendent of the Southern Weaving Company, Greenville, S. C., which started operations a few months ago.

Back-Filling Bleached Goods in India.

(*Continued from page* 246.)

No water is added to the mixing tub, and that is needed is used for diluting the ingredients, so that they will pass more easily through the seive. The mixture must be well stirred after each application. Allowance must be made for the increase in volume during the boiling, unless indirect steam is used.

This mixing when boiled should make 90 gallons.

The following is a lighter mixing suitable for a better quality of cloth than is the one above:

80 lb. corn starch.
9 buckets china clay (4 lb. per gallon).
3 quarts turkey red oil.
6 gallons mercine glaze.
3 pints resin size.

Gauge the water so that the mixing will boil up to 90 gallons. From this mixing the finisher will be able to work out a recipe suited to his particular cloth. Generally speaking, the softer spun the yarn is and the thicker the weft, more Turkey red oil can be added. If the cloth is open, the yarn tightly twisted, and the weft thin, it is advisable to keep the finish on the hard side or the clay will dust. A fairly firm finish on a low quality cloth will mellow considerably after being baled for some months.

Certain qualities of bleached twills can be back-filled on this machine with good results, the twill being improved in the process.

The following is a good mixture:

30 lb. corn starch.
90 lb. white dextrin.
1 gallon mercine glaze.
1 gill turkey red oil.

Boiled to 90 gallons.

If a good luster is desired, the addition of a little borax is recommended.

Certain qualities of striped shirting are dyed after bleaching and require filling. If china clay has to be added, the goods must be back-filled. The following mixing will be found very useful:

75 lb. corn starch.
30 lb. white dextrin.
3 buckets china clay.
6 quarts turkey red oil.
1 pint glycerine.

Boil up to 90 gallons.

If the cloths are of a very low quality, it is advisable to tint the starch.

Many useful finishes on grey cloth can be carried out on this machine, but shrinkage must always be allowed for.—*The Dyer and Calico Printer.*

Uneven Roving.

EDITOR COTTON:

I should be glad if some of the readers of "How Other Men Manage" would send in some suggestions on how to overcome uneven roving. We are troubled with this in our mill; after the roving is spun and twisted into ply, the ply is not parallel. From tests we find this is due to uneven roving.

E. B. S. (CANADA)

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Fly Frame Winding.

EDITOR COTTON:

In the November issue of COTTON I find an article entitled "The Fly Frame" and written by "J. L. (Mass.)." The fourteenth paragraph reads as follows:

"The actual revolving of the bobbins being chiefly performed by the fixed bevel wheel on the frame shaft, as in Houldworth's motion or by the cross shaft as in Howard & Bullough's differential motions, and not as is often supposed, by the cone drums and their attendant motions, these only imparting such revolutions in a bobbin-leading frame as to equal the surface speed of the roller. For instance, a frame with a spindle speed of 1,250 revolutions per minute and a front roll speed of 115 revolutions per minute would, if the diameter of the empty bobbin and the roller were equal, only receive from the cone drums 115 revolutions, whereas from the fixed part it would receive 1,250 revolutions; so that while the cone drums only perform part of the winding, they perform that part which is most vital, the part of evenly regulating the tension of the roving, and to do this the cones are designed on the principle of a parabolic curve, this curve being adjusted into a pair of concave and convex cones so as to allow the belt to be always maintained at one tension and to allow proportional adjustments to the increasing diameter of the bobbin, and it is at this point in the regulating of the proportional adjustments that the troubles of a frame come in."

The above is so misleading that I could not let it pass unchallenged. "J. L." is no doubt a subscriber to COTTON and must have in hand Professor Parker's Cotton Mill Machinery Calculations. If he will turn to page 132 he will find the following:

"The bobbins must revolve as fast as the spindles and enough in excess of this speed to wind on the amount of roving delivered by the front roll. As the bobbins increase in size, the number of revolutions necessary to wind on the roving decreases, and consequently the bobbins must decrease in speed."

Continuing in the same paragraph, Mr. Parker states, "The compound receives this variable speed from the bottom cone, combines it with the constant speed of the main shaft, and delivers it as one motion to the sleeve gear. The speed of the bobbins, due to the motion of the main shaft, considering the bottom cone as being stationary, is equal to the speed of the spindles and consequently no winding would take place."

Continuing again, he states in the same paragraph, "When the bottom cone is in motion, the speed of the bobbins is greater than the speed of the spindles, and the roving is being wound on the bobbins. This additional speed of the bobbins, spoken of as the excess speed of the bobbins, is due to the bottom cone speed and is necessary to produce the winding."

The writer has had always a great regard for Mr. Parker, having followed his work for years and found him always correct. As referred to in the foregoing, Mr. Parker conveys to us, that on all bobbin leading fly frames, we have two speeds, one known as the constant speed and the other as the excess speed. The first refers to all constant speeds, while the other means the speeds of the bottom cone and its train to the bobbins.

When Mr. Parker states: "When the bottom cone is stationary no winding would take place," he is dead right, and proves "J. L." dead wrong when he states: "The bottom cone performs only part of the winding." The bottom cone performs all of the winding.

Following is the proof: Consider the spindle and flyer as standing still, and we will assume that the roving will draw through the flyer without twist and without breaking. Thus it will be seen that the bottom cone is the only agent to wind on the roving. But we have to put twist into the roving. To accomplish this we drive the spindle and flyer at a positive speed, and in direct relation to the front roller.

So, from the foregoing, it can be deduced that the two speeds referred to have each their purpose. The constant speed delivers and puts in the twist while the excess speed does all the winding-on; not a part of it, but all of it, and without aid from the driving shaft, as "J. L." would have us believe. How can the driving shaft or the fixed bevel gear be a help to the bottom cone when the bottom cone drives the differential sleeve at a higher rate of speed than the periphery? If "J. L." answers this letter I hope he will explain.

Like "H. H. Y.," "J. L." mentions the parabolic curve, but it does not mean anything.

I should like to have "J. L.," after reading the following dope to sit down and enlighten me on the following:

Let us assume that owing to a radical change in the hank roving we are forced to change the compound pinion from 20 to 18. This, you must admit, would reduce the speed of the bobbin, and would also cause a necessarily smaller lateral movement of the rack at each completion of the carriage. What effect does the foregoing change have on the parabolic curves of the cones?

Wash (R. I.)

The Winding Motion on a Roving Frame.

EDITOR COTTON:

So far as I know the subject of the winding motion on the roving frame has not been dealt with in COTTON, at least, not in its entire principle. I hope, therefore, a few remarks relative to this subject may be of interest.

There are, of course, several operations, each one in itself a complete motion, and yet all are essential to successfully wind the roving onto the bobbin. In the first place, the bobbin must revolve so as to wind the roving onto itself, as it is delivered by the front rolls. Secondly, it is necessary to impart to the bobbin a vertical movement so as to lay the coils of roving side by side, spirally. Third, a motion is necessary whereby the direction of traverse of the bobbin can be changed at the end of each layer. Fourth, we must have a means by which we can make each succeeding layer of roving shorter, to build the bobbin with a taper, so that the coils at the top and bottom of the bobbin will not slip off the edges and thereby spoil the work.

The first motion, that of winding the roving on the bobbin, necessitates changing the r.p.m. of the bobbin as each succeeding layer is wound on, so that the surface speed of the bobbin will be maintained equally with that of the front roll, as the diameter increases. This change of speed is effected through the use of the builder motion, differential and cones.

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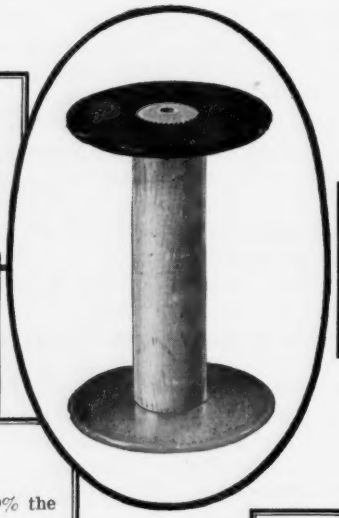

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The bobbin receives its motion from two sources. From a constant speed from the jack-shaft and a variable speed from the cone drums.

It is necessary to have some means of controlling the variable speed furnished by the cone drums, and for this purpose the builder motion is used. The builder regulates the position of the cone belt, changing the belt to a new position each time the traverse motion changes. As each change in traverse takes place the builder moves the cone belt a slight distance toward the large diameter of the bottom cone, thus reducing the r.p.m. of the bobbin to compensate for its increased diameter.

The two drives, that is the jack shaft and the cones, are brought together at the differential motion. This arrangement is so conceived that, without the cone drive, the bobbins and spindles will run at the same speed, with the result that no winding of the roving would be possible.

The speed of the traverse of the bobbin rail must be slowed down, as the bobbin increases in diameter to allow extra time for the coil to be wound on. This is accomplished by driving the traverse from the cones.

The direction of traverse is changed at the end of every layer by means of the builder motion and the twin gears. These are a pair of bevel gears having the same number of teeth and are set opposite each other, with the teeth to the inside. These twin gears are driven by a small pinion and are so set that only one of the pair of twins may be in mesh with the pinion at one time. The twin gears are mounted on a sliding shaft and as the carriage reaches the completion of the traverse a catch is released which moves the shaft sideways, throwing one twin gear out of contact and the other in contact. The pinion revolves incessantly in one direction, and by throwing first one twin and then the other in mesh alternately the direction of traverse is changed. This change must essentially be brought about very rapidly, of course, otherwise a slovenly taper will result. The English builder, employing dead weighting, has a decided advantage in speed over the American type which uses a spring and segment gear, although the American builder is not nearly so complicated as the English builder. The traverse from top to bottom of the bobbin is much more easily changed on the American type, also.

The length of traverse that the rail makes is also governed from the builder motion. The catch governing the changing of the twin gears is so contrived that it changes a little earlier at each succeeding layer put on the bobbin. This is, of course, the tapering motion.

To properly set the winding motion when starting up a new frame, the speed of the bobbin must be such that it will just take up the roving delivered by the front rolls, when winding on the bare bobbins.

If the bobbin does not make the required r.p.m. to properly take care of the roving being delivered, the bottom cone gear should be changed. This gear, being a driver, a smaller cone gear will give the bobbin less r.p.m. and a larger gear a greater number of r.p.m. When making this adjustment care must be taken to see that the cone belt is as far back as it can be set. When a change of one tooth in the bottom cone gear is too much, a slight change in the position of the cone belt will be necessary to properly adjust the bobbin speed.

When once the bottom cone gear has been found for correct winding, it should never be changed, unless the diameter of the empty bobbin is changed for some reason, or else a very hard-twisted roving is to be made. As a very hard-twisted roving contracts on the first layer, it would have the same effect as a slight change in diameter on the empty bobbin.

After the first layer has been adjusted to wind on correctly, no changes should be made to get the correct tension on the successive layers, except by changing the tension gears. The tension gear controls the distance the belt is moved on the cones at each succeeding layer.

The most important thing connected with roving frames is, in my estimation, tension. If the tension is too slack, the bobbin will be very soft and the ends will break at the flyer, causing stoppage and too many piecings. If too tight, a greater evil will result, that of stretched, uneven and weak roving.

When testing out a new frame for proper tension, only a few ends should be run until the correct gear has been found. There is no set rule for figuring the proper tension gear on a new frame. This can be ascertained only by experiment.

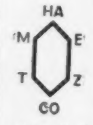
When making a test for the correct gear, make a change of one tooth each time until the end runs slack, then change back one tooth to the tight side. Each time a change is made in the gear, a new set should be started, commencing on the bare bobbin, and continuing to run until the ends become too tight or too slack. Continue to run the frame and change the gear until the tension is so adjusted that it does not begin to run slack until the last few layers of the full bobbin have been reached, then change back one tooth. The reason for running to the slack side is obvious—a slack end can very easily be detected, while a tight end will stretch considerably before it can be seen and remedied.

The most common trouble with tension is running slack, and this may be caused by one of several things. The bobbin and bobbin rail are both driven from the bottom cone, so that anything that would tend to produce undue friction would cause the ends to slacken, through slippage of the cone belt. A few of the common faults are, the slides requiring oil, or not being properly set, the bolsters needing oil, or not being plumbed properly so that the spindle binds, and the bobbin gears requiring oil.

The lay gear has also considerable effect on the tension. I firmly believe that it is best to change the lay gear whenever a change in numbers is made.

If the tension gear is changed, and the lay gear remains the same, it will affect the tension on the ends considerably, as the lay gear has a certain amount of control over the diameter of the bobbin. Should the lay gear be kept constant when changing from a fine roving to a coarser one, the coils will be packed closer together, due to the increase in the diameter of the coarser roving. This will cause the bobbin to increase in diameter faster than its normal rate, causing the ends to run tight. When once the proper gears have been determined, to give the correct tension, the lay constant should be found and should always be used when making a change in numbers. C. C. (N. J.)

R. D. HARVEY is now assistant superintendent at the Aragon Mills, at Aragon, Georgia. Until recently he was connected with the Massachusetts Mills at Lindale, Georgia. He is a graduate of the Georgia School of Technology.



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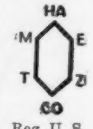

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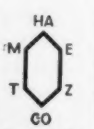

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Reproducing a Cloth From a Sample.

EDITOR COTTON:

In view of the fact that most of the designing work done in this country is copying or reproducing from old samples, this letter may be interesting. To be sure this subject has been treated by many eminent authors both in this country and abroad. But this letter is a little bit different.

To reproduce a cloth is not at all the simple matter it first may look. Men who are engaged in this kind of work know what it means. It is all very simple, if the copying is purely copying. What I mean is that the reproduced cloth should be exactly like the original one. But suppose conditions call for a change, which is quite usual. Then many real problems will come up. For instance, a sample is received from a broker. Within a comparatively short time he expects to see a reproduced sample and with it the quotation. It is understood that he will sometimes send out many samples to different mills, and he will compare the reproduced samples as well as the quotations. A little change here by the designer will cause a difference in price, which usually means to get or to lose the order. This is especially important when the mill is short of orders and wants to keep running. Of course, there are numerous examples and it is as often that the change is done the other way. By that I mean it does not always follow that the change is intended to lower the manufacturing cost. Now let us see how this thing works out!

The following example given here is just one example to show the general method that should be followed in order to facilitate the work. It is almost impossible to cover all the cases in a short article like this.

Let us assume that an analysis of the old sample cloth gives the following data:

The sample contains two kinds of warp—on top and bottom beams—and only one kind of filling. Sley and pick 68 x 58, reed width 30 inches and cloth width 28 inches; yards per pound, 5.24; the yarns used, top beam 2/15, bottom beam 28, and filling 32—all being cotton yarn. An examination of the patterns in detail and a little calculation shows that in 100 yards of cloth there are 3.11 pounds of top warp, 9.50 pounds of bottom warp, and 6.47 pounds of filling.

These are our data to work with. Let us further suppose that the broker wants us to make the following change (the change is here purposely made very simple in order to make it clear in the beginning): To use the same pattern and the same sley and pick and change the counts of yarns to make the reproduced cloth to be 6.00 yards per pound instead of 5.24. The balance of the pattern must be retained.

Most of the authors work out the layout plan first and this is where the writer differs from most of them. The writer proposes to follow it out in the following manner. Without touching the layout plan at all the counts of the different warps and filling can be found. Let us see how this works.

With the data given, first find out the percentage in weights of the different warps and the filling.

Illustration: $3.11 + 9.50 + 6.47 = 19.08$ pounds.

Top beam will be $(3.11 \times 100) \div 19.08 = 16.3$ per cent.

In the same manner we find the bottom beam to be 49.8 per cent and the filling beam to be 33.9 per cent. The total of the three being 100 per cent.

The second thing is to find the average count. Now here we come across another interesting subject, but owing to space and time limitations we will not discuss it here. The way to find it is to multiply the count of the yarn by its percentage and divide by one hundred. This formula is correct. The proof of it is nothing but a mathematical mix up, so for our purpose here we will assume it to be right without further question.

By arranging the foregoing into tabular form we get something like this:

Old cloth—5.24 yards per pound.

	Wt.	%	Count	Average count
Top beam	3.11	16.3	2/15	2.44
Bottom, inches....	9.50	49.8	28	13.95
Filling	6.47	33.9	32	10.83
Total	19.08	100		27.22

Here is the average count of the cloth. That is to say that if we replace all the counts of the warps and filling by 27.22s, the yards per pound would still remain to be 5.24. The number 2.44, 13.95, etc., are obtained by the formula given.

The next thing is to find the weight of 100 yards of this new cloth we want to make. As required the yards per pound is 6.00, and it follows that the weight in 100 yards is

$$\frac{100}{6} = 16.666 \text{ pounds.}$$

Next we divide up this 16.666 pounds in the proportion as in the old cloth to the warps and filling. This being done, we can get the counts of the warps and filling in the new cloth by multiplying the counts in the old cloth by a factor, $6 \div 5.24$. We can also get the average count of the new cloth by multiplying the average count of the old cloth by the same factor. After we get the actual counts for the new cloth, we can check the numerical work by multiplying the counts by its percentage and divide the result by 100. These added together should be equal to the average count we get by the first method, namely,

$$27.22 \times \frac{6}{5.24} = 31.2 \text{ average count for new cloth.}$$

By tabulating the second part of our calculation, we get for the new cloth something like this:

New cloth—6.00 yards per pound.

	Wt.	%	Count	Average count
Top beam	2.72	16.3	17.2	2.85
Bottom, inches ...	8.30	49.8	32.0	15.95
Filling	5.646	33.9	36.6	12.40
	16.666	100		31.2

The last one proves that our numerical work is right. I must add that in both cases the column Wt. represents the weight in pounds of that yarn (warp or filling) in yards of cloth. Since our calculations are all based on 100 yards. The reason why 100 yards is chosen is just to

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make the calculation easier. Any other number can be used without altering the answer.

The foregoing is a very simple case. Of course, there are many others, more complex ones. For instance, if the sley and pick or either of the two is changed, the calculation will be different. But the present one serves very well to illustrate the general principle involved in such problems. Incidently it also brings to light the importance of the average count in helping to simplify the solution of such problems.

H. H. Y. (Mass.)

A Rule for Humidity.

EDITOR COTTON:

Writing under this subject in your October issue "T. A. A." explains the advantage which he claims for maintaining the humidity by preserving a constant ratio between the dry bulb temperature and the wet bulb temperature.

Without quarreling in any way with your correspondent's statement it seems to me that he is "putting the cart before the horse." The ratio which he recommends is that the wet bulb thermometer should read 88 per cent of the dry bulb, which corresponds very closely to maintaining a constant relative humidity of 63 per cent provided that the temperatures are observed with the sling psychrometer. If they are observed from the ordinary wet and dry bulb thermometer the humidity would in fact be considerably lower than 63 per cent—probably too low for the best working conditions in spinning or weaving but possibly enough for the card room.

Now it would seem to me no easier to observe the thermometers and to go through the calculation of applying the percentage to find out whether the relation between them is correct or not than it is to observe the thermometers and then find whether the humidity is correct by consulting a table or a calculator. Either method may be used but the ratio should be correct if we use "T. A. A.'s" method and the correct humidity should be selected if we use the ordinary method.

The important thing is that the observations should be taken with a correct instrument and not with the ordinary unreliable wet and dry bulb stationary thermometer. Unless the instrument is correct, the inferences drawn from the observations will be wrong and the atmospheric condition will therefore be wrong.

It is on this very point that many manufacturers fail to realize the advantages of an automatic humidity regulator. All good regulators are designed on the very principle that your correspondent describes—namely, that the humidity may be held constant at any desired level by maintaining a constant ratio between the wet and dry bulb thermometers. If the regulator is one of a reliable make it will perform the following operations:

First. It will observe the temperatures correctly.

Second. It will mechanically perform the process of comparing the temperatures, and

Third. The moment the proper ratio is departed from in either direction it will turn the humidifiers off or on until the ratio between the temperatures is restored to its correct value.

No amount of temperature-taking and hand control of a humidifier system will even approach the stabilization of humidity that a good regulator can accomplish, and it costs more per year to attempt to do it by supervision than it does to purchase and operate a regulator. Only a few weeks ago the agent of a large mill told a friend of mine that in the last year he had paid for two regulators which he never received. Then he went on to explain that he had hired two men to give their constant attention to the adjustment of the humidifiers in his mill in the attempt to keep the humidity at the proper level by going about reading the wet and dry bulb thermometers and then adjusting the humidifiers. At the end of the year he found that the wages of these two men had cost him more than the price of the regulators which were needed to equip the mill and his records showed that he hadn't secured the regulation—his humidity had varied from 20 per cent to 25 per cent. So he put in automatic regulators.

Possibly some of your readers haven't seen the matter in this light.

Your correspondent is quite right in saying that cotton must be considered as well as humidity. Many manufacturers prefer to regulate to correspond to a condition of constant regain. This is perfectly possible with automatic regulation and is widely practiced. It merely requires that the ratio maintained between the wet and dry bulb temperatures shall be modified slightly so as to correspond to a constant condition of regain instead of to a constant condition of humidity. THIRSTY COTTON.

To Improve Yarn Strength.

EDITOR COTTON:

In his question on how he could improve his yarn strength, in the September number, "E. A. G." failed to say whether he uses single or double roving in the spinning room. I will assume he is using double roving, and answer him accordingly.

The breaking strength of 70 pounds that he gets on his 26s yarn from his 1 1/16-inch staple is very good, regardless of what the overseer of spinning thinks about it, although it does not quite come up to Draper's standard on breaking weights. I make a 28s yarn from 1-inch graded staple, and my weight runs around 74. It is okeh in the spinning and weaving also.

"E. A. G." doesn't say whether he has more than one process of drawing other than his railway head, but it seems to me at first glance that his 6.00-hank frame roving is a little too fine for this number of yarn. I make a 5.75 hank for 28s, with double roving in the spinning. If I were "E. A. G." I would shorten my drafts on the intermediate and make about a 2.00-hank roving, and then make about a 5.75-hank roving on the fine frames. This would require about a 11.05 draft in the spinning, which would not be bad.

Some further suggestions I might make for increasing the breaking strength are: Increase the doublings on the finisher drawing frames by adding one strand of sliver, lighten the drafts to make the desired weight on the front. Have the spinner wax the spinning bands in the following manner: Give the bander a piece of bees-wax when he ties on a band, and after he has turned it loose when tied, let him hold this wax so that the band can get coated all around. This, we have found, will increase the breaking strength from three to five per cent.

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Some time ago we found that the diameter of our bands had got too small, that is to say, the grooves in the spindle whirls had worn round. Upon examination we found that there was no groove frictional contact as was intended when the whirl was put out. So we had to increase the diameter of the bands, or make them heavier, to take up this worn groove. Travelers also can play a prominent part in the strength of yarns; travelers that are too heavy weaken the yarn.

I assume that "E. A. G." has the carding in good shape. A few suggestions might be, to look after the tensions, oiling, twisting and cleaning, especially on the top rollers; the evenness on the pickers; the evenness of the setting on the cards. The stripping of the cards should be watched and in getting up the sliver after stripping, time should be allowed for the sliver to get back to its proper weight.

T. A. D. (GA.)

The lubrication of looms is always a problem. The older method of allowing a boy to go around with an oil can and a pad, pointing the can at each bearing in turn and forcing some oil out of the can, not only is wasteful, but owing to lint filling the oil-hole, often the bearing does not receive sufficient lubrication. A more modern method has been the application of grease as a lubricant because of the diminished tendency to fly around. Now, however, the Carr Fastener Co., Boston, 39, Mass., have developed the "Dot" lubricator as a quick and positive way of getting grease to the bearings. This device, it is stated, makes the greasing of a bearing easier and quicker than the task of oiling was in the past, and once a loom is fitted with the proper "Dot" nipples, pointing out in the safest directions, the operation becomes as simple as turning a key in a series of locks, as one hand does it all, the manufacturers explain.

To fit the "Dot" system to looms already installed requires some machine work. The usual method is to take off the upper half of the bearing, plug up the two oil holes with wooden pegs, and drill a new hole through the center. This hole should be drilled to a ⅛-inch pipe tap as this is the standard size of the "Dot" nipple. The bearing is put together again, and the nipple screwed down until it is tight. If it is an angle nipple and does not point out in an accessible position, it should be turned further in until it is properly pointed. Then the application of the grease gun does the rest. The Walraven Company, Atlanta, Ga., are distributors of this system.

C. J. Tagliabue Mfg. Company, 18 to 88 Thirty-Third St., Brooklyn, N. Y., have just issued a new edition of their textile catalog, a very interesting and comprehensive booklet regarding temperature control in the textile industry. The catalog is known as No. 902A, and contains 52 pages. At the beginning of the book are shown simplified flow charts of the cotton and woolen industries, which show the important processes in these industries which require automatic temperature control. The next two pages explain briefly the principal "Tag" indicating, recording and controlling instruments.

The next 24 pages—half of the book—are devoted to discussions of the more important textile processes requiring automatic control. For the cotton mill man this section contains discussions on warp sizing, dyeing, drying, etc., written from the standpoint of the textile man rather than

from the standpoint of the temperature engineer. These discussions contain some very interesting information and data regarding temperature control in the various processes.

The balance of the book is left for the catalog proper—and this has been compiled in such a way as to make it convenient to specify and order "Tag" recording, indicating and controlling instruments for the various applications.

Southern Textile Basket Ball Tournament.

BY W. M. GRIER.

Textile executives will be interested to know that, considering the number of competing athletes, the Southern Textile Basket Ball Tournament, held in Greenville, S. C., each year, is the largest athletic event in the South. Of course the college football games draw larger crowds and the college tournaments are more widely advertised and are given more publicity, but from the standpoint of the number of active participants, nothing in the South today touches the textile tournament.

By way of contrast, consider the S. I. A. A. and S. I. C. tournaments with a recent tournament of the textile organization. In the first there were thirteen teams, and in the second about the same number—and the Southern Textile tournament had fifty-one teams in it! Allowing ten men to a team that makes five hundred and ten active participants against something like a hundred and thirty or forty in the college tournaments.

The teams in the textile tournament are drawn from Virginia, North Carolina, South Carolina, Georgia and Alabama, so the scope of territory is greater than that of the colleges. The class of playing in our tournament is regarded of the highest quality by the officials of the games, who are brought in from colleges, city athletic clubs, and the like. Most of the players have never played football, and the roughness characteristic of college playing is entirely absent.

But while the Southern Textile Basket Ball Tournament is great from the standpoint of numbers of participants, and extensive in the scope of territory covered, more important are the underlying principles in the establishment of the tournament. What are these?

Just a few years ago a great many of the mills went in strongly for baseball. It was popular with old and young alike, and since it was an out-door sport, it was splendid for the physical development of the participants. But there were serious problems that arose in connection with baseball. One of these was the question of professionalism, and there is no doubt that it has crippled its usefulness and popularity in mill communities for a long time to come. Players outside of the regular mill employees were brought in and paid for playing ball, and thus were the mill employees deprived of the benefit of out-door exercise. The class of players brought in were not of the highest roder, and while they were nominally on the pay-roll they were not actual employees and they loafed around all week and their moral influence was not good.

Then it was that some of the far-sighted recreational directors of the mills realized that something must be done to counteract this tendency, or sports of all kinds in the mill communities would be injured. They were convinced that the problem of professionalism in baseball would be hard to cope with, and they decided to attempt the solution by inculcating in the minds of all lovers of sports the idea of clean athletics along the lines of basket ball, and realizing these standards, by applying them to all other lines of sports. Then the idea of an annual meet of the best teams in the South was conceived, and the Southern Textile Tournament was suggested and begun.

The first year there were only eight teams. One year later there were sixteen, and the following year there were fifty-two teams in basket ball and eleven teams in volley ball and checkers. The volley ball and checkers have been abolished, but it is entirely probable that the Southern Textile Athletic Association, which fosters the tournament, will bring in other forms of tournament at different seasons of the year, and in this way reach more employees. The predominant idea in the minds of the promoters then was the encouragement of purely amateur athletics.

Next came the idea of clean sportsmanship. The players receive nothing for their efforts, and they are to play clean in every particular.

Another great purpose in establishing the tournament was the just recognition of the athletic ability of the mill boys and girls. After the sports had been purged of professionalism, after the players had become imbued with the spirit of clean sports, the organizers felt these players should be recognized in the sporting fraternity.

The Tournament receives splendid support from many mill executives and new teams are entering every year.

Efficiency Experts.

EDITOR COTTON:

In his article "Efficiency and Progress" in the November number, "Optimistic" gives the right dope. I am not referring to his splendid article because he agrees with some of my statements, but in order to add something that he left unsaid.

Manufacturers must be protected against these so-called efficiency experts who have caused and are causing a great deal of trouble in some of our cotton mills. It may be interesting to the readers of this department to know how these so-called efficiency experts are employed by some of the engineering offices. They first make application to an employment bureau; next, the applicant is questioned, and if he is smooth, and a good talker, he gets the job. See the point?

Then he is set loose with the title of efficiency engineer, and if he has gall enough, he will add letters before or after his name.

These are the type of men that are often placed on research work at our mills. Of course there are some that measure up to standard, but as yet, being unfortunate, I have never met one. Wash (R. I.)

The market in Persia for artificial silk is increasing in importance, the demand being chiefly for cloth. There is also a demand for threads, yarns, and manufactured articles, according to a report to the Department of Commerce from Vice Consul George G. Fuller, Teheran. The goods are at the present time coming principally from the British Empire. Germany, however, is increasing her trade, and a small amount has been received from the United States. The colors in demand are black and pale blue, pink, and green.

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The territory traversed by the Seaboard Air Line Railway has been surveyed for its textile opportunities by Lockwood, Greene & Company, Engineers.

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DEVELOPMENT DEPARTMENT
Seaboard Air Line Railway Company,
202 Oglethorpe Bldg., Savannah, Georgia

Chas. A. McKeand
General Industrial Agent

Clement S. Ucker,
Director of Development

THE SEABOARD—THROUGH THE HEART OF THE SOUTH

Carding Discussion Held at Greenwood.

(*Continued from page* 240.)

extreme care must be exercised, otherwise the cotton of course would curl.

David Clark, of Charlotte, asked Mr. Blair whether in view of his statements he believed if a heating coil were placed under the picker beaters, it would assist in cleaning the cotton. In answer Mr. Blair explained it was necessary to have the cotton subjected to a specified relative humidity for a long enough period of time to secure this effect, and it was his opinion that in passing through the machine the cotton would not be in this condition long enough to produce this result. At the same time, Mr. Clark stated, he felt this was a point well worth investigation.

"If you will use a sling psychrometer, and get your humidity in your opener room, at a low relative humidity of about 35 to 40, and watch the laps as they come from the front of the picker, and then watch them at a fairly high humidity, you will find there is quite a difference, and that the cotton will clean much better when it is dry." This statement was from Mr. Blair.

"That has been my idea in connection with the discussion we have had," said Mr. Dilling. "Two or three years ago there was considerable discussion on equipping the picker rooms with humidifiers, and some people have told me they got excellent results. But I have observed that most of the people who got good results from this were those whose product did not require that they clean their cotton very well. If you want your cotton to be cleaned at the pickers, it cannot be done as well when the cotton is damp as when it is dry."

"Mr. Blair mentioned the point of the cotton taken from Phoenix to Boston absorbing enough moisture to pay the carrying charges," commented Mr. Dilling, "and of another place finding 11 per cent in the bale. Some of us might investigate this point and find out where our invisible waste, or a large part of it, is coming in. If the cotton we get has a high percentage of moisture, and we finish the product with 8½ per cent in it, if we had 11 per cent in the bale we have lost 2½ per cent that cannot be accounted for. But in investigating this point some of us might be able to account for some of our invisible waste."

"I heard a mill president in Greenville talking about moisture in cotton yesterday," said J. H. Huff, superintendent, Camperdown Mills, Greenville, "and he said that the locality has a great deal to do with it; that cotton grown in Anderson County, South Carolina, has about 8 per cent, and that Texas cotton has about 4 per cent. Talking about drying in the picker room, which is more important: to dry and clean the cotton, or to keep the moisture in it?"

Mr. Blair explained that with humidification further on in the mill, it was a simple matter to return the moisture to the cotton. Mr. Huff asked whether it were possible to have an output as great as the input. Mr. Blair replied it is possible to have it greater, but as to the advisability of doing this, he left this to the local conditions and judgment of the particular mill.

With reference to the amount of regain for the different departments, Mr. Dilling explained that one prominent humidification engineer has issued charts showing the percentage of moisture in baled cotton to be 8 and 9 and possibly 10 per cent, recommending 3 to 4 per cent regain in the picker room and cards, going up gradually to 8 or 8½ per cent. Tests made in mills leaving 10 to 11 per cent in the finished product had proven that the goods would mildew upon being stored, he stated.

"It seems to me at this point, from what Mr. Blair has said," commented T. J. Digby, superintendent, Oakland Cotton Mills, Newberry, S. C., "that it would be a good proposition to install an extra heating system in the opening room and bake the cotton every night and run it through the next day and clean it." In response Mr. Blair explained that the time limit, as well as the top and bottom temperature limits would have to be watched, and that if the temperature got too high the cotton would be ruined, while if it were kept too low, time would be wasted and nothing gained.

The discussion next was turned to the subject of vertical openers and horizontal cleaners. In introducing it, Mr. Dilling said that "in the past few years practically every machine manufacturer has been building vertical openers, and now they are making horizontal cleaners, that work together. Some of the manufacturers of these machines recommend that a vertical opener and a horizontal cleaner be used together; and that the horizontal cleaner be not used by itself."

In further explanation of the question, Mr. Touchstone stated that the main point to be brought out was the condition of the stock after passing through the opener, whether it be vertical or horizontal. "The principal reason that question was included," he explained, "was that some people in the last year or two are falling out with the vertical opener saying they do not get good results and that it doesn't leave the stock in as good condition after passing through the vertical opener." Reporting on his own tests, Mr. Touchstone stated that on 1-inch western cotton, testing for five weeks, the records showed 3.95 per cent taken out at the vertical opener, doing 5,800 pounds per day of ten hours. On local South Carolina stock, run at the same speed, under the same conditions, etc., he got out 4.15 per cent.

"As for the condition of the stock after leaving the opener," continued Mr. Touchstone, "I find that as good as I could judge, the western stock is not as loose and fluffy as we would like to have it when it gets into the hoppers upstairs. It seems as though the local stock is easier to handle." Mr. Touchstone added that he uses the perforated screen in his vertical opener, and sets the beaters one inch from the face of the screen, all the way up and down. In answer to questions he said in the test reported he had used all compressed western cotton, and that at the beginning his local stock was in plantation bales, but before the test was finished it, too, was compressed. He could not say whether the western cotton came by boat or rail, and Mr. Blair commented that "this would make a difference, as the local cotton would be compressed to 22 pounds per cubic foot, and the western cotton, if shipped by boat, would be 33 pounds per cubic foot."

"We have vertical openers in both of our mills," said W. P. Campbell, overseer carding, American Spinning Company, Greenville, S. C. "At first we had the screen in them, and our percentage of waste was one-half of one per cent; then we put in the grid bars, and are now making a test which has not been completed. However, so far the test shows that with bars our waste percentage has increased about one-third."

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As to the condition of the stock, Mr. Campbell added that, "with the vertical opener the condition of the stock is considerably better than before we put in these machines, and since we put in the bars we find we get more motes and leaf from the pickers; it seems to open it up and prepare it better for the pickers, and as a result the cards have less to do."

J. T. Hunt, overseer carding, Unity Spinning Mills, LaGrange, Ga., at this point stated they had to abandon the vertical opener on their better grade on account of the cotton being curled; he ran the opener at a speed of 700 r.p.m., he added.

T. N. Crocker, superintendent, Joanna Cotton Mills, Goldville, S. C., stated that about two years ago he had installed a Murray cleaner which enabled him to run compressed cotton that had been a problem previously. "I like the horizontal cleaner better," he said, "because I get that 120 feet of cleaning space. It opens the cotton in nice shape and takes the trash out. We are running our Murray at about 328 r.p.m. We are planning to increase our plant and expect to install a vertical opener, but I do not intend to discard the Murray because I like it very much. We will have possibly two verticals and then run it through the Murray, and we think we will be able to get along with a lower grade cotton.

"Previous to installing the Murray, I might add, on 30s yarn we were compelled to use strict middling, inch cotton, but after putting in this machine we have gone down to strict low middling, making the same numbers of yarn. Looking at it from that standpoint alone, it is one of the most economical things a mill can invest in."

"We have the same horizontal cleaner that Mr. Crocker has," said F. C. Todd, superintendent, Ruby Cotton Mills, Gastonia, N. C., "and we are getting mighty good results. We average about three pounds a bale of dirt. This is mostly all dirt, too, as we cannot sell it; we have to put it on our land. We get much better results in picking and carding. It relieves the cards materially. The breaking strength of the yarn is increased about six per cent.

"We have a neighbor who has a vertical opener, and he came down and saw my Murray, and then put one in tandem with his vertical, and he is now getting about the same dirt from the cotton after going through the vertical as before. He is getting real results from it.

"A few months ago a friend called me up and asked me how fast I ran my Murray, and I told him around 400 r.p.m. He asked me to come over to see his. He was having trouble with it curling the cotton. I went over and asked him how fast he was running it, and he said about 400 r.p.m., but we put a speed indicator on it and it showed he was running it 760 r.p.m. He cut the speed down and didn't have any more trouble. The longer the staple, the slower you must run a horizontal cleaner.

"If I had room I would put in another Murray. Some people say it will hurt the cotton, but I cannot see how it can do it."

"Some people claim if we run the cotton through the vertical opener, and then through the horizontal cleaner, the vertical opens it up so that the horizontal can clean out the dirt," commented Mr. Dilling.

A gentleman from the Arkwright Mills, Arkwright, S. C., reported that in one mill they have a vertical and horizontal in tandem, and only the horizontal in the other mill.

"In your laps going from these machines, do you experience more trouble in variation where you do not have the vertical?" asked Mr. Touchstone. "There is a little mite of difference in favor of the tandem system," was the answer.

The following organization was reported by Mr. Hightower: "Good middling cotton, inch-plus staple, all western cotton; Murray cleaner running at 425 r.p.m., and waste worked back into stock and put through Murray, giving a good mix with about one per cent of waste from the Murray; into a breaker machine running 1,260 to 1,300 r.p.m., with a 14-ounce lap; then from the breaker into an intermediate picker with carding beater running 900 r.p.m.; and then into a finisher picker with carding beater running 850 r.p.m., making a finisher lap of 12 ounces. A card sliver of 45 grains, and breaker drawing of 50 grains, and 55-grain finisher drawing sliver; .75 hank roving on slubber; 2.00 hank on intermediate, 6.00 and 7.00 on fine frames. I get a good lay-out and splendid results." He reported further the breaking strength was very good. In explanation he added that the scavenger and roving waste, etc., is run through a Kitson No. 1 machine and a waste machine with carding beater, and then goes through with the cotton into the Murray.

"I am from up in the section where the mills use long staple cotton," said Mr. Dilling, "and there have been a number of horizontal cleaners installed. There has been more or less discussion as to the value of the horizontal cleaner; some mills claim that it damages the staple and others claim on the other hand that they get good results by cutting down the speed. They say what Mr. Todd just brought out, that on the longer staples a reduced speed is necessary."

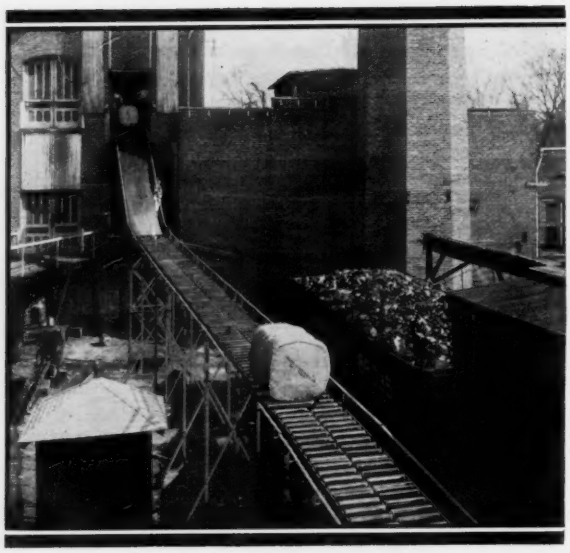
Mr. Crocker asked Mr. Hightower if the draft on roving frames indicated by the lay-out given was not a bit too high. "I get a draft of 6.92," responded Mr. Hightower. "If I have got to have excessive draft, I had much rather have it in the card room than in the spinning room."

Taking up the subject of lap lengths, which was discussed at the Charlotte meeting in January, Mr. Dilling asked for tests.

Mr. Crocker expressed the opinion that variation in the length of laps was due largely to different moisture in the cotton; in dry weather, he said, the lap fluffs up and the cotton expands more. If the cotton contains the proper amount of moisture, he pointed out, the lap will be properly condensed. He related an experience where he sprinkled the floors around the pickers with very good results from the standpoint of lap length. Mr. Touchstone said his experiments had shown a variation in weight throughout the lap of one ounce, varying from 11 to 12 ounces per yard, and that his lap length variation ranged about ¾ of a yard.

Here the trend of the discussion was diverted onto one-process of roving by the following statement from Mr. Dilling in connection with lap lengths: "Some of us, I believe, are talking about letting our laps run wild and by the time it gets to the second drawing it will get all right again."

Mr. Clark again referred to an instance he had mentioned in previous meetings—that a successful concern in the East never sets a lap back, and uses only one process of drawing, equipped with eveners. He expressed the opinion



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that two processes of drawing will not make better yarn than one process.

Mr. Todd disagreed. "I had one process of drawing and two processes of picking. I added one process of picking and one of drawing, and if Mr. Clark will come around to my mill I will show him the difference in one process and two processes. I make underwear yarns, and I have a 16-inch knitting machine in my office to test the yarns on, and I will show him some fabric under the glass, and he can see there is a big difference. Our breaking strength increased about two pounds when we put in the second process of drawing. If I had room I believe I would put in another process, although it might ruin me; but I would be willing to try it."

In answer to a question, Mr. Clark stated the speed of the one-process drawing was 220 r.p.m.

"In our No. 1 Mill," said Mr. Campbell, "we took a notion after the last carders' meeting that we would try out Mr. Clark's idea. Our superintendent was very anxious that we cut out one process of drawing. They told me they were doing it successfully over at Woodruff and we decided we would try it. We make 30s yarn out of 5.50 hank roving and when we cut out one process of drawing our spinning room went all to pieces, and our breaking weight went down from 62 to about 56 pounds, and we had to put in the second drawing process."

"What speed?" asked Mr. Clark. "On two processes we run 350 r.p.m., and when we cut out one process we pulled it down to 210 r.p.m.," replied Mr. Campbell.

Mr. Willis recalled an experiment on 1 1/16-inch cotton, making an 11-ounce lap, in which it was shown that the variation in the lap was 22 per cent; on the first drawing, 12 per cent, and on the second drawing it was cut down to 6 per cent.

A gentleman from the Woodruff mill stated at this point, in connection with Mr. Campbell's remarks, that they had found it necessary to put the second process of drawing back again, after the breaking strength had dropped considerably with only the one process.

Mr. Kersey, of LaGrange, brought up the point, in connection with unevenness of laps, that manufacturers are paying more attention to humidification in the preparatory processes, with which Mr. Dilling agreed.

"We had this lap length question up at the Charlotte meeting," commented Mr. Campbell, "and I went back to Greenville and looked over my pickers. You know, we have a knock-off motion with a lever and a drop-catch. I found that this lever was worn and the corners rounded off about a quarter of an inch, and the catches were worn, and I went to work and had these catches and lever milled off and put a piece of case-hardened steel on each so that when the points left each other there would be nothing to hold them. I had all my machines worked over, and find a considerable reduction in the variation in the length of the laps."

The next question related to the variation in card sliver between strippings. On the questionnaire, Mr. Dilling pointed out, tests were requested on the card sliver 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 minutes after stripping.

On a test taking one yard from each of ten cards, two hours after stripping, reported Mr. Touchstone, he had found a variation from 53 to 46 grains, giving an average of 47.9 grains, for a 48-grain sliver. As to testing immediately after stripping, he made the following report:

"Three other men and myself stood in front of four cards, and when the cards were stripped out, we were ready, and we pulled the cylinders on at the same time, and put the doffers in together, and let it run out a minute at a time, with the following results: for the first minute, 42.4 grains; at the end of the second minute, 46.4 grains; third minute, 47.3 grains; fourth minute, 47.4 grains; fifth minute, 47.7 grains; sixth minute, 48.4 grains; seventh minute, 48.7 grains; eighth minute, 48 grains; ninth minute, 48.5 grains; and tenth minute, 48.3 grains. Showing that after the fourth minute you will not get enough variation to hurt you."

Mr. Blair said that on long staple cotton, tests showed it took five minutes for the sliver to get back onto standard.

"On four cards, for the various times from one to ten minutes," said Mr. Dilling, "on a 40-grain sliver, the average the first minute was 34.6 grains; and on the third minute the average came up to 40.31 grains. In three minutes' time it was back to normal."

Another gentleman reported he had found it took four minutes to get back to normal.

J. T. Hunt, of the Unity Spinning Mill, LaGrange, Ga., reported he has several sets of the Arnold evener device, described on page 1229 of the October number of COTTON. He said they were at present running tests on this and had found it to materially reduce their variation.

Mr. Hightower said he had not tested this, but had experimented with the amount of strips taken off by each flat. "The average man," he said, "will tell you that 20 grains would be a good average of strips from each flat. Our cards have 103 flats, about 49 of them working all the time. We found an average of 18.70 grains per flat. We card 120 pounds per ten hours."

"I believe from three to four minutes seems to be the average time for a sliver to return to its normal weight after stripping," observed Mr. Dilling. "That's not as bad as we once thought it was."

Mr. Southern said he had noticed that the variation on some cards was greater than on others, and that in investigating this, he had found it to be due to the fact that some of the strippers pulled the feed out while others did not.

The next question was asked by Mr. Touchstone: "In a mill running around 30s yarn, how often do you strip the cards?"

"Three times a day," answered Mr. Campbell.

Carding 95 pounds a day, on a 40-inch card, one man reported, when he stripped five times a day the breaking strength—yarns between 30s and 40s—was about 13 pounds under what it went up to when he began stripping only three times a day.

"We stripped four times a day for about five years," reported Mr. Hunt, "and then we cut it down to three times, and now only twice a day. The superintendent thought that wasn't enough, and I made tests, first stripping every half hour, and then every hour, and then every two hours, and so on, which convinced him we were getting our best breaking strength with our present method. We have 40-inch cards, carding 175 pounds a day, making a 61-grain card sliver."

"On middling cotton, inch-plus, we strip cards twice per day, at starting time in the morning, and starting up after dinner at one o'clock," reported Mr. Hightower.

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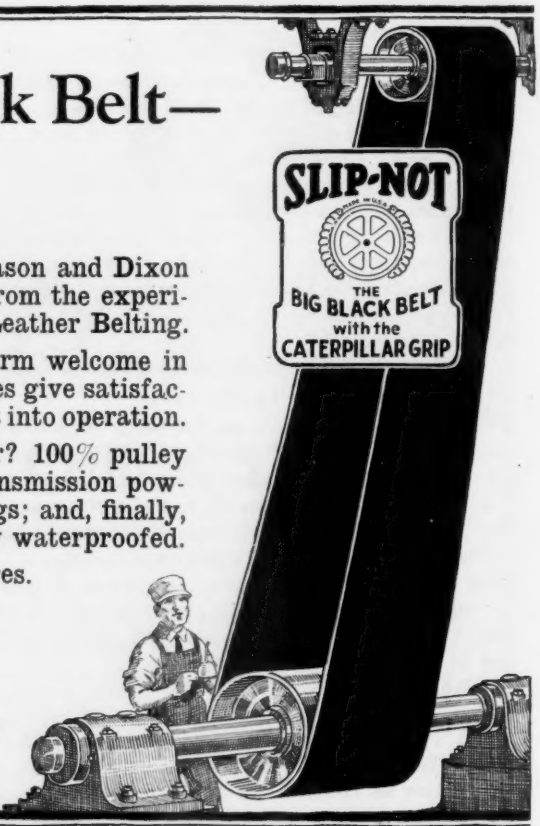

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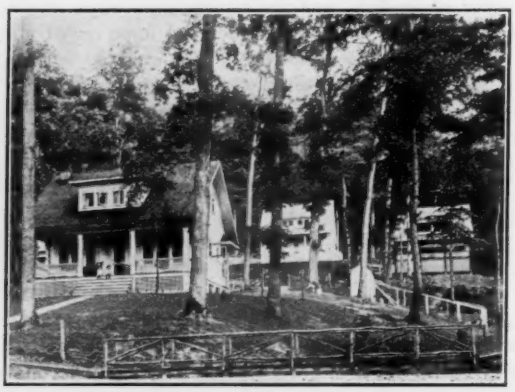

Beautiful Homes for Plant Officials

"I have worked on all kinds of cotton, and I have never yet seen a system of card stripping that would beat two times a day. I card 142 pounds per day of ten hours on a 40-inch card, making 30s and 40s out of strict low middling cotton," said Mr. Crocker.

"I have been experimenting some," said Mr. Campbell. "This question brought another idea to my mind. I believe that the card has a whole lot to do with the strength of the yarn in the spinning room. I went so far as to figure out just how many teeth on the licker-in struck one square inch of cotton. We know the licker-in has eight rows to the inch, and about four teeth lengthwise, and so I figured out that my square inch of cotton was struck by 33,000 teeth. I said 33,000 knocks to the square inch was too much, and I brought it down to about 20,000, but I didn't increase the breaking strength. Nevertheless, this setting of the cards, and speeds of cards, and the number of pounds a card gets off per day has something to do with the breaking strength, and we want to find out what the happy medium is."

"We made an experiment with the licker-in, reducing it from 430 r.p.m. about one-third, and did not notice any difference in the breaking strength," reported Mr. Folk, of Clemson College.

Mr. Layton said that once his card hands complained about wages, and his superintendent told him to cut from three down to two strippings a day. Later on, he said, the superintendent took him to the cloth room to show him neps in the cloth, and he reminded him that he had instructed him to cut out one stripping. "Put it back, then," said the superintendent.

L. V. Andrews said he had changed from three to four strippings a day, with much better results, working for a cleaner cotton.

The lack of carding machines in most mills was next discussed, Mr. Dilling pointing out that formerly the machinery agent and the engineer would say, "You can put in thirty cards to do this by carding 150 pounds a day," and the mill president would do that, with the result the mill would suffer. When the No. 2 Mill of his own company was built, he said, they first planned on 32 to 40 cards for a 15,000 spindle mill on fine yarns and that he later convinced them they should have 55 cards, and that now the treasurer admits it is one of the best investments the mill has made.

The concluding discussion of the morning related to methods of opening compressed cotton. Mr. Hightower was of the opinion that if it should be "run through a Murray cleaner it would not damage it, but would fluff it up and make it loose; and then through a vertical or Crighton opener. I believe it would then be ready for the picker." Mr. Crocker said the only solution he had found was to have it opened by hand by negroes; although this is expensive.

"In running cotton, a great many people have terribly high drafts in the conveyor pipe," said Mr. Hightower. "I believe that if you will not run it through too quickly, that these beaters will help you a great deal."

The meeting was called off at 12:30 o'clock, and the members ate luncheon, following which the afternoon session was begun in the Oregon Hotel, at 2 o'clock.

Keeping Numbers in the Picker Room.

At the afternoon session Mr. Dilling brought up the question of variation in roving, drawing, and section beams.

"The question seems to me to be one of where do you make your changes," said Mr. Touchstone. "The last few years, more especially, changes have been made in the picker room, where it is practical to do so, and we do not change many gears in the mill. That may seem to be a broad statement, but it is proven, and I have the figures.

"First of all, let me say that I have tested mine for a period of a year, or very nearly a year, and up to four weeks ago there was not a gear changed in the mill—all numbers were kept by one man in the picker room. The recent changes were unavoidable from outside causes.

"On 1 1/16-inch western cotton, with all changes made in the picker room, I have run my laps according to the relative humidity found in the room. This is determined from a standard wet-and-dry-bulb machine. The scales are set by the finisher man according to a table that I had figured out, basing the moisture in the cotton at six per cent; then figuring out a table; regardless of where the relative humidity in the picker room went, my laps would go with it according to that table.

"The laps were run according to this table, and they varied with the weather, going all the way from a relative humidity of 20, when the laps weighed 39 pounds and 12 ounces; then at a relative humidity of 24, when the laps weighed 39 pounds 14 ounces; then 28, when the laps weighed 40 pounds, and so on as the relative humidity varied four points the scales would vary two ounces, up to a relative humidity of 52, then I changed to two ounces for every two degrees of relative humidity, and up to where it reached 70 or 75 relative humidity.

"During one 20-day period, for example, my slubber roving varied five grains, from a heavy of 138 to a light of 133 grains. (I do not consider hank roving, as I can keep up with it much easier by considering grains.) On the intermediate roving, the heaviest was 51.5 grains; the lightest was 49.6 grains, giving a variation of 1.9 grains. On my 5.56 warp roving, which should weigh 18 grains, the heaviest was 18.6 and the lightest 17.2, a variation of 1.4 grains throughout that period of 20 days.

"We check the section beams as closely as we do the pickers. We do not pay any attention to anything between so far as the numbers are concerned. During the 20 days referred to the warp sizing was: lightest, 29.50; heaviest, 28.32, a variation of 1.18 numbers. We run 407-end section beams to weigh 401 pounds, and out of 118 beams I got a variation of 14 pounds during that period of 20 days, from 407 to 393."

In commenting upon Mr. Touchstone's remarks, Mr. Southern stated he had used a similar system, not so elaborate, of varying the weight of his laps to correspond with the changing relative humidity in the picker room, and had had mighty good results.

"How much does the cloth vary in the weave room?" Mr. Digby asked Mr. Touchstone. "We have had no serious trouble at all with our cloth variations," was the answer.

"In case you had a sudden change, would you change it on the slashers, or would you go back to the picker room?" asked Mr. Hightower. "If you went back, I should think it would take you several weeks to get through."

"I would change the filling," said Mr. Touchstone.

"Is your yarn hard-twisted or soft-twisted?"

"I suppose you'd call it medium-twisted," said Mr.

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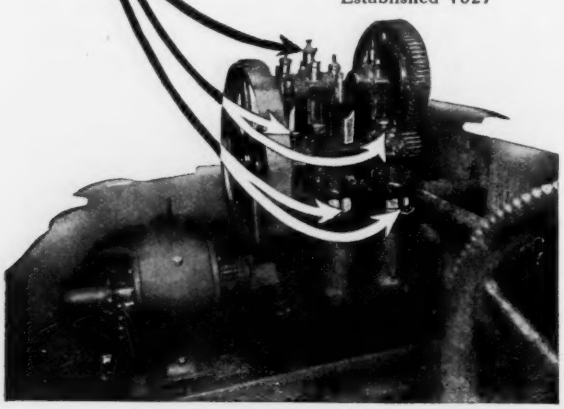

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Touchstone.

"Well," asked Mr. Hightower, "if you have a soft-twisted yarn, isn't it more apt to take in humidity during wet weather?"

"I should think that would be taken care of in the weave room," replied Mr. Touchstone.

"I am just a little bit interested to know that these numbers are kept so well," said Mr. Hightower. "My experience has been a greater variation than that."

"I had the pleasure of going over Mr. Touchstone's job recently," said B. R. Dickson, superintendent of the Greenwood Cotton Mills, "and I saw the most even running work I have seen in a long time. He had the least variation in his beams that you gentlemen would strike anywhere over the country. His beams run right on the standard, two points off and two points on."

"Of course, if his cotton is all one length, and one grade, one strength, one thing all the way through, it is easier," commented Mr. Hightower, "but if he had a soft cotton and a strong cotton he would have a variation in there that would cause trouble."

"Does your spinner have to change the draft gear once in a while, Mr. Touchstone?" was asked by Mr. Layton.

"During this entire period there was not a draft gear changed in the entire mill, either carding or spinning," replied Mr. Touchstone. "With reference to the cotton," he continued, "I was on 1 1/16-inch local cotton, I use the same system except that of course I had to vary the table."

"Do you have any trouble keeping the cloth in the five-point limit?" asked Mr. Dickson. "None, to my knowledge," was Mr. Touchstone's reply.

Mr. Willis asked Mr. Touchstone if, in figuring out the table, he based it on the relative humidity in the spinning room. The reply was that a certain figure, say a 40-pound lap at 40 relative humidity, was taken as a base and variations made both ways from that point. He brought out also as the relative humidity increased it was necessary to change the proportion from two ounces to every four points to two ounces to every two points. In response to a question, he said he allows a half a pound variation each way in his laps.

Going onto the next subject, Mr. Dilling asked, "What are good settings of drawing rolls for 15/16-inch local cotton?"

"I never saw anybody who could set them close enough," observed Mr. Layton.

"1¼-inch, 1 5/16-inch, 1 7/16-inch," were recommended by Mr. Hightower, going from front to back. "That takes in a 45-grain card sliver, 50-grain breaker drawing sliver for the finisher."

"In setting the drawing rolls, do you make any difference in the settings for local and western cotton of the same length?" was Mr. Dilling's next question. "I do not change anywhere except for different weights," said Mr. Hightower.

"On 1-inch western cotton, from bite to bite, and figuring in sixteenths," said Mr. Touchstone, "I set from back to second, 1 6/16 inch; from second to third, 1 5/16; from third to fourth, 1 4/16 inch. I have set them a dozen different ways, and I get a smoother, better-looking sliver from these settings than from any setting I have been able to get.

"On local cotton, I use the same settings, except the front roll, which is 1 1/16-inch, giving a clearance of 3/16-inch. On the local stock I am running a 45-grain card sliver, and on the western cotton I am running 48 and 50."

"How do you designate the bite of the roll?" asked Mr. Dilling. "The larger amount of stock in there the further away from the roll it will get it. The smaller the amount the closer up into the roll. Do you make the same allowance for that between the front, second and back rolls?"

"I make it in proportion to the body of the stock; for that reason I make such a great variation as I go back," replied Mr. Touchstone. "Going back, the stock has not been drawn through, it is rougher and lies together closer, and has a heavier body. For that reason the allowance is necessary to give it a chance to pull it. As you get closer to the finish of the draft I do not think it is necessary to be so far apart because the stock is more open. I get my settings by putting a piece of carbon paper between the rolls, and where the flutes mark through on it is what I consider the bite of the rolls."

Mr. Campbell said that he had found when he gets the rolls set just right for the cotton being run, in order to take care of the little curl caused by the metallic rolls, probably the next week, he does not get the same results from the same settings. He said this curl bothers him more on the light work than on the heavier sliver. This curl, he said, appears between the front roll and the calender roll in the web.

"It may be in the setting of the cards," suggested Mr. Hightower. "But the same grinder grinds the cards for both," replied Mr. Campbell, adding that the same cotton from the same warehouse is used, the same pickers are used, same cards, and everything is the same with the exception that the sliver is lighter.

"We decided it was in the pitch of the metallic rolls, and we asked the metallic roll man to come down and look over the drawing. We wanted to get a smoother work, and I wanted the curl out. He came down and said he could stop it by changing the pitch of the rolls, and he sent us another set of metallic rolls, with a finer pitch, but it did not stop it."

"How many cards does your grinder handle?" asked Mr. Hightower. "Twenty-three," said Mr. Campbell.

"If you have a curl on the fine work it might be due to what Mr. Touchstone brought out," said Mr. Layton, explaining that the difference in the amount of stock should be considered and allowance made for it in making the settings. "You will find the distance from the bite to bite isn't the same on the fine work as on the heavy work."

"But I've tried every setting from closed up to far off, changing by 64ths of an inch," said Mr. Campbell.

"We once put in some new steel rolls and found that some of these rolls were delivering faster than the calender roll would take it up," said Mr. Hightower. "When we started up these rolls we had a 46 tension gear, and I put on a 42 and a 48, and in spite of everything we had one or two deliveries that we had to break back. We finally found that the factory had sent some rolls that were 2/1000ths large or small, and I had to send them back."

Mr. Dilling next asked whether the men made any difference in the twist in local and western cotton. "We say the western cotton is coarser and harsher; can you run more or less twist in it, the same length of fiber."

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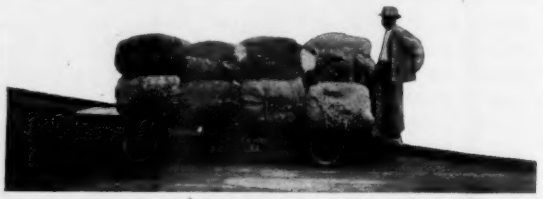

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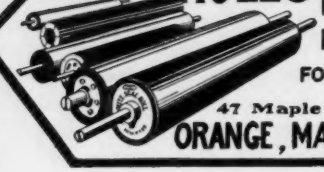

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One man reported he puts a little less twist in the western cotton because it has more fibers in it of the same length.

"I have run both, of the same staple, and did not change the twist at all," said Mr. Todd. "I have run California, South Carolina and Mississippi cotton without making any difference in the twist."

"I am running local cotton, and there is a difference, which I think I can explain," said Mr. Crocker. "We are supposed to run 1-inch cotton. In western cotton we get more fibers that are 1-inch than we do in the local cotton, and so we can run with less twist.

"In stapling cotton, I comb it out, and if you will do this, you will find that the South Carolina cotton will have fibers in it running from ½ inch to 1-inch, while in the western cotton there is a larger percentage of the fibers that are full length."

"Our mills are soon going from local to western 1 1/16-inch cotton," said Mr. Campbell, "and I am very anxious for anything that will give me any information on this work. I have all my settings for local 1-inch cotton. Perhaps we will go onto the western cotton next week. They tell me it takes less twist, and a lighter lap."

"For the same weight sliver at the cards," said Mr. Touchstone, "I make a difference of 1.82 pounds in my laps. I run the laps of local cotton 1.82 pounds heavier than the western cotton." Mr. Layton said he had to run his laps one pound lighter on the western cotton, and the other gentleman who had changed agreed with this experience.

The final technical question brought up was, "Where is it better to carry excessive draft—on the spinning or roving—when it is necessary."

"In my estimation," said Mr. Layton, "it is better to have it on the roving frame. If you have it on spinning, you have no subsequent doublings to take care of it, while if it is on the roving, you have the doubling on the spinning."

Mr. Dilling stated that on a test he had made, he had changed the draft on the jack frame from 12 to 13 hank, and had reduced the draft in the spinning and increased the yarn breaking strength about four or five pounds.

In closing the meeting, Mr. Dilling said, in connection with what had been brought out regarding local and western cotton: "Our farmers have been up against it, and we want to help them if we can, but they are going to have some of us up against it, too, if we do not get a little better cotton. We must do what we can to induce them to improve the quality of their cotton by using a better quality of seed, by giving it more attention, so that they can give us better qualities. Otherwise we are going to be forced from necessity to get more of our cotton from other places."

In this connection, Mr. Clark, of Charlotte, stated that North Carolina has begun a method of elimination of inferior seed in the state, taking the territory by sections. Mr. Willis pointed out that in the Southeast certain sections will be found to be producing better cotton, while likewise in the West certain sections produce the shorter staples. It is up to the mills, he said, to encourage this development of better agriculture by insisting upon cotton from the sections doing the most to improve conditions.

L. A. STARNES has become overseer of spinning at the Vance Cotton Mills, Salisbury, N. C.

The Cotton Market for the Year.

(*Continued from page 252.*)

has placed the West in a much better financial condition, thereby increasing its purchasing power.

Another constructive development has been the gradual reduction in taxes in America and Europe, with prospects for further cuts in the future, which is helpful to business.

The restoration of confidence is attended by American gold coming out of hiding and seeking investment, as noted by the recent renewal, for the first time in several years, of shipments of the precious metal from the United States to Europe, which is of much concern and value to the southern cotton growers who are to benefit as the world gradually returns to normalcy.

In this connection, it may be recalled that in normal times, or before the world war, the world consumed more of American cotton by 3,500,000 bales than was consumed last season when mills had to resort to short time, in many instances close down for the want of sufficient raw material and because of the very high prices then prevailing. As a matter of fact, during the season of 1911-12, the world consumed 14,600,000 bales of the American raw product, or more by about 500,000 bales including linters, than this year's crop promises to be.

Production vs. Consumption.

(LINTERS INCLUDED.)

Season	Actual Growth	Consumption	World's Carryover July 31st
1920-21	13,750,000	10,500,000	9,364,000
1921-22	 8,442,000	12,829,000	4,879,000
1922-23	10,424,000	12,631,000	2,573,000..
1923-24	10,985,000	11,241,000	2,319,000
1924-25	..est. 14,092,000	est. 13,000,000	est. 3,411,000
Total	...57,693,000	60,201,000	

Under the circumstances it would seem as if there is no need for uneasiness as to the future, for while this year's crop happened to be about 3,000,000 bales larger than last year's production, consumption promises to be nearly 2,000,000 bales larger than it was last season, which would leave only a moderate world's carryover at the close of this season, and there is no assurance of the making of another good crop next year.

The world needs more of the raw product for this season than was grown this year. It is only a question if it can pay for it. That the world can aford the price, it is only necessary to refer to the past season to prove that the trade has the means to foot the bill. Last season, when international political and economic conditions were not nearly so favorable as they are this season, the world paid $1,658,243,040 to the South for its cotton, or an average price of 31.67 cents for middling. If the trade was to spend as much money for American raw cotton this season as it spent last season, it could, on the basis of 23 cents, the present value of middling, buy 14,400,000 bales, or more than this year's crop, including linters, promises to be.

Spinners of the world are at work preparing to take an unusually large amount of American cotton this season, probably not only for this year's requirements, but, perhaps, for a part of next season's wants, as they are not likely to risk the possibility of a short crop next year, in which case higher prices would likely prevail for new

crop deliveries.

This is indicated by the rapidity with which this year's crop is being marketed, the staple being rushed to tide water and overland in transit to foreign and domestic mills. So far this season, or since August 1st, the movement to market totals 8,343,000 bales vs. 6,891,000 to even date last season, and exports from the United States to date amount to 3,492,000 bales, against 2,659,000 one year ago. Exports from the United States this season are likely to be in excess of 7,000,000 bales vs. 5,805,000 bales, including Canada, last season. During the season of 1911-12, or 13 years ago, exports from the United States were 10,502,000 bales, which indicates the possibility of the future, in this respect, when world conditions become normal.

While this year's crop is in process of being marketed, and while receipts continue comparatively heavy, it will probably be difficult for prices to advance much; they will do well to hold their own. In fact periodical declines are likely, but no great slump in values is probable unless something unfavorable now unseen occurs.

With the opening of the new year, the outlook for the next crop will attract more attention. At the moment plowing is backward, especially in the Southwest, due to the prolonged drouth extending into December, and the comparatively low price, about 11 cents, or about $55 per bale lower than at this time last year, is discouraging to farmers, as next year's crop will be very expensive to raise owing to the high price of foodstuffs, which figure materially in the cost of raising cotton.

Then there is the possibility, if not probability, of unfavorable weather being experienced at planting time. It is reasonable to anticipate such a development since so little rain was had in the cotton region during the last half of 1924. A wet, cold Spring would be very unfavorable, as planting would be interfered with, which is not unlikely of development since weather conditions usually work from one extreme to the other.

Just now there is not the good season in the ground, especially in Texas, as was the case at this time last year. In fact the autumn average precipitation in Texas is less than it was in the three previous short crop years in that important State. Last year's good season in the ground in Texas is said to have been much help to the crop in that State last Summer by nourishing the plant during the protracted drouth, and the hot weather assisted materially in preventing weevil activity, not only in Texas, but in all sections of the belt.

Today the situation in Texas and other sections of the cotton region is not so favorable, due to the lack of sufficient moisture in the soil. The average rainfall in Texas for the past three months is the lightest in a generation if not on record for this time of the year, as noted by the following comparatives: In inches.

YEAR	1924	1923	1922	1921	Normal
September	2.92	4.61	2.48	4.02	2.82
October	0.60	4.85	2.16	0.57	2.62
November	0.72	2.92	2.58	0.95	2.39
Total, 3 mo.	4.24	12.38	7.22	5.54	7.83

As to the weevil, their absence in usual large numbers during the summer of this year was attributed to last year's severe winter, which was the coldest in 25 years in some sections of the eastern belt, especially in Georgia, serving to kill insect life, which made possible the making of a good crop in the face of a protracted drouth, but the acreage was the largest on record. After all it was not a bumper crop, which is a poor showing considering more fertilizer having been used on the largest acreage on record —41,390,000 acres. In 1920, or 4 years ago, the South made 13,440,000 bales exclusive of linters vs. 13,153,000 this year, on an acreage of 37,043,000 acres. If this is the best that could be done on so large an acreage, it does not speak well for the future in event of the acreage being reduced or if weevil emerge from hibernation in large numbers.

According to advices from Texas and the South Atlantic states, many weevil, which made their appearance late this season, but too late to do much damage this year, went into hibernation for the winter. It remains to be seen if we are to have a mild or hard winter. If the cold weather is not as severe as it was last winter, more weevils than last year may survive and be heard from next year.

Aside of the possibility of experiencing a wet, cold season in the spring, as well as the possibility of a larger percentage of weevil surviving this winter, there is the probability of the acreage being reduced in the spring owing to the very high price of grain and provisions. This year the corn crop was a failure in nearly all sections of the South, particularly in the Mississippi Valley states and in Texas. This will likely necessitate the pitching of a big grain acreage, especially for corn, as there is a great scarcity of foodstuffs in the South for man and beast, with almost prohibitive prices prevailing, and the increase in the grain acreage will probably be at the expense of the cotton acreage.

Because of the big discount at which they are quoted, the uncertainty of the next crop, and as trade, especially in Europe, is likely to expand as the year 1925 grows older, and at a time when it was on the decline last year, we favor buying, particularly on depression, new crop deliveries, October preferred, as any advance of consequence in the future will probably be derived principally from the outlook for the next crop, which, at the moment, is not at all encouraging because of the lack of rainfall for subsoil requirements, the possibility of damage by weevil and the probability of a reduction in the cotton acreage owing to the high cost of foodstuffs and the comparatively low price of the staple.

EDWARD SCHENCK is now resident manager of the plant of the Wallace Wilson Hosiery Co., Inc., at Salisbury, N. C.

J. H. MILLIKEN has become superintendent of the Love Knitting Company, Burlington, N. C.

GEORGE H. HUGHES is superintendent of the new plant of the Borden Mills, Inc., at Kingsport, Tenn. C. Calvin Holmes will be assistant superintendent. Mr. Hughes has been an assistant superintendent at one of the Fall River mills of the American Printing Co., while Mr. Holmes has been overseer of carding there for several years.

B. M. SPRATT, JR., has become secretary-treasurer of the Blue Ridge Cotton Mills, at Connelly Springs, N. C., succeeding J. L. Schrum.

HARVEY W. MOORE, formerly treasurer of the Thrift Mfg. Co., Paw Creek, N. C., recently was elected mayor of Charlotte, N. C.

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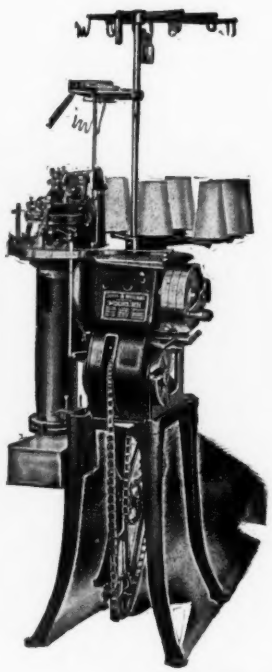

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QUISSETT MEANS QUALITY

A Simplified Order and Shipping System

BY "PRACTICAL KNITTER."

The purpose of this article is to describe a simplified system of entering orders and filling them in the shipping room, and to explain its operation. The economy effected in the reduction of labor, and in eliminating duplication of effort, should give an appeal to the progressive knitting mill manager.

This system at present is in practical operation in a ladies' silk hosiery mill, shipping largely to retailers, making from fifty to one hundred and fifty shipments per day. It is so simple, yet comprehensive, in its use, there is no reason why it cannot be applied with little, if any, changes to any other kind of a mill, whether shipping to jobber or retailer. By making a few changes in the body of the order it can be used equally as well in cloth mills, overall factories; in fact, in any textile factory. It supplies a complete office record of a sale, reducing practically to impossibility any chance for errors, and is convenient and easily understood.

Through observation in plants with which he has been connected, and in those visited throughout the United States, the originator of this system has wondered why mills, otherwise progressive, continued the ancient method in the office and shipping room. While all of these varied in detail, they all required what seemed to him unnecessary duplication of work, and placed the important responsibility of re-writing the order on the so-called shipping ticket or packing slip, on the man in the shipping room, who was employed to pack goods and not to do clerical work.

With a view of abolishing these factors, therefore, he has devised the system herein described.

To illustrate the use of this system, we will assume a hypothetical order being received. There is, in reality, only one main form used, which is shown as Figure 1. Similar to this, with several minor changes, is the "Shipping Ticket" shown on Figure 2. These forms come in sets of two, perforated at the point indicated at the top of Figure 1. The order is made out on these two forms, making the shipping ticket as a carbon copy of the original order.

Using the illustration, an order for a shipment of hosiery is received from T. W. Kimberly & Company, Chicago, Illinois, on November 10, 1924, having been sold by O. W. Rogers on November 7th, on terms of 2/10 Net 30, to be shipped by prepaid express, at once, and entered in the factory as Mill number 2612.

Taking this form and inserting the sheet of carbon, the clerk in the office fills in this information, then down in the body of the order he lists the style numbers, the colors of each style, and the number of each size in each style, spacing the styles so that it will be easy to distinguish the two in the Shipping Department, as will be noted the three line space in Figure 1 is left vacant between styles 65 and 450. The office clerk fills in the price per dozen at which the goods were sold.

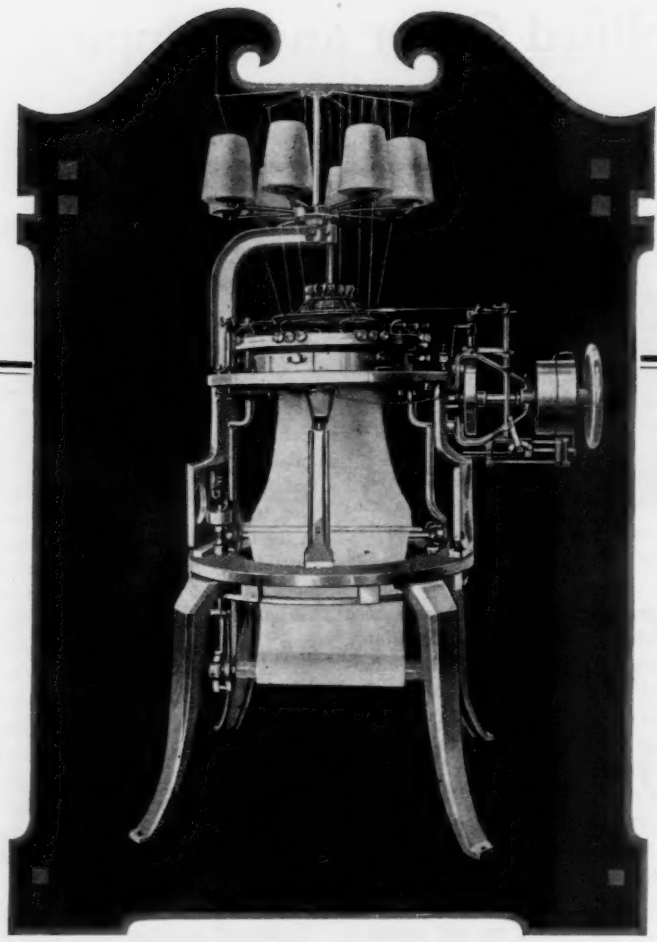
All of this, of course, goes on the shipping ticket through the carbon paper. However, the carbon paper is cut to extend only to the line just above the space reserved for "Remarks." The reason for this is the office man may add for his own information any remarks which he might not wish to appear on the shipping ticket which goes to the customer with the goods. As you will note by the "Remarks" on order in Figure 1.

When properly filled in, the order blank and shipping ticket, still together, are sent to the shipping room for the order to be filled. A sheet of carbon is used here, also, this time a full length sheet, and as each item in the order is placed on the packing table, the operative merely checks it off. He places his name or initials on the line marked "Checked by," the packer then packs the goods into the shipping case, initials the order and shipping ticket, indicates the data shipped on the order, as well as the case number, still using a carbon paper in order that this information may appear on the order and shipping ticket. He then tears the shipping ticket from the order and places it in the case, and has completed all the work necessary. *The outstanding feature of this system is that all the clerical work required of the men in the shipping room is that they initial the tickets and fill in the case number and date shipped.* No chance for a costly error! And how different this is from the usual method used in the knitting mill!

The order form is returned to the office, where the billing clerk adds up the items checked off and places the number of dozens shipped of each style in the column marked "Total Dozens" opposite the price column on the left, as in space marked "X" in Figure 1. The multiplication of the number of dozen by the price per dozen is then extended in the column marked "Amount." This operation is done for each style listed on the order, and then the order is ready to be invoiced, which can be done by girls of little or no experience, as it is only necessary to copy the information from the order onto the invoice. After the invoice is made, the order is filed, and since there is only one sheet, filing space is reduced considerably from that used where bulky forms are clipped together and used. And this one form gives all the information necessary regarding the order. When the customer receives a shipment of goods, it is not necessary for him to hold the shipment until the invoice arrives, as on his packing slip there is complete information as to when the order was received by the factory, the date it was to be shipped, the date it was actually shipped, the price of each style, and terms upon which the purchase was made. The shipping ticket comes to him in neat typewritten form and is very easily checked. The order, which is filed by the office, is an exact duplicate of the shipping ticket the customer receives, and also serves as the order from which the goods were shipped.

If for any reason any size or style should be out of stock, the shipping clerk simply would draw a ring around the number on the order, and this, when it was returned to the office, would be held as a "back order" for this item to be filled when this style or size came into the stock room. The same procedure would apply to the "back order."

The foregoing is based on an order for immediate shipment. In case of an order sent for future delivery, the form in Figure 3 is used, which is an "Acknowledgment of Order." This comes in pad form and is simply put between Figures 1 and 2, with necessary carbon paper, and



Wildman Spring Needle Body Machine

Perfection in knitted fabrics is assured when your product is made on the Wildman Spring Needle Body Machine.

Every Wildman Machine is known for its accuracy of mechanical construction in all details and the uniform high quality of materials used in its manufacture.

Nothing is left to guesswork.

From the original design to the final knitting test, each operation is under the control of experts in our own completely equipped plant.

Let us send you an illustrated instruction book giving full information about the Wildman Spring Needle Body Machines.

We have issued a very complete and informative book, "The Science of Knitting"—Price $3.00

TRADE MFG MARK

WILDMAN MFG. CO.

NORRISTOWN, PA.

Date Sold: 10-7-24
Date Received: 10-10-24
Sold by: O. W. Rogers

ORDER PLACED WITH
BLANK KNITTING CO.
OSHKOSH, FLA.
SHIPPING INSTRUCTIONS

Sold to: T. W. Kimberly & Co., Dept. H.,
Address: 1539 W. Halsted St., Chicago, Ill.

Terms: 2/10 Net 30
Route Via: American Express - Paid
Date Shipped:

Date to Ship: At Once
Mill No.: 2612
Customers's Order No.: G-4730
Salesman's Order No.: 127

STYLE	COLOR	ASSORTMENT 8	8½	9	9½	10	10½	Case No TOT. DOZ.	PRICE	AMOUNT
65	Black		1	2	2	1				
	Gun Metal		½	½	½	½				
	Fawn		¼	¼	¼	¼				
	Beige		½	½	1	½				
	Polo		¾	¾	¾	¾		X	12 00	
450	Black		1	3	3	1				
	White		½	½	½	½				
	Burma		1	2	2	½				
	Mesa		½	1	1	½		X	8 00	

Remarks: Dept. and Customer's Order Number must appear on case. Do not value this shipment (Customer carries own insurance). Include all advertising matter with shipment. Send invoice in triplicate.

Packed by

Checked by

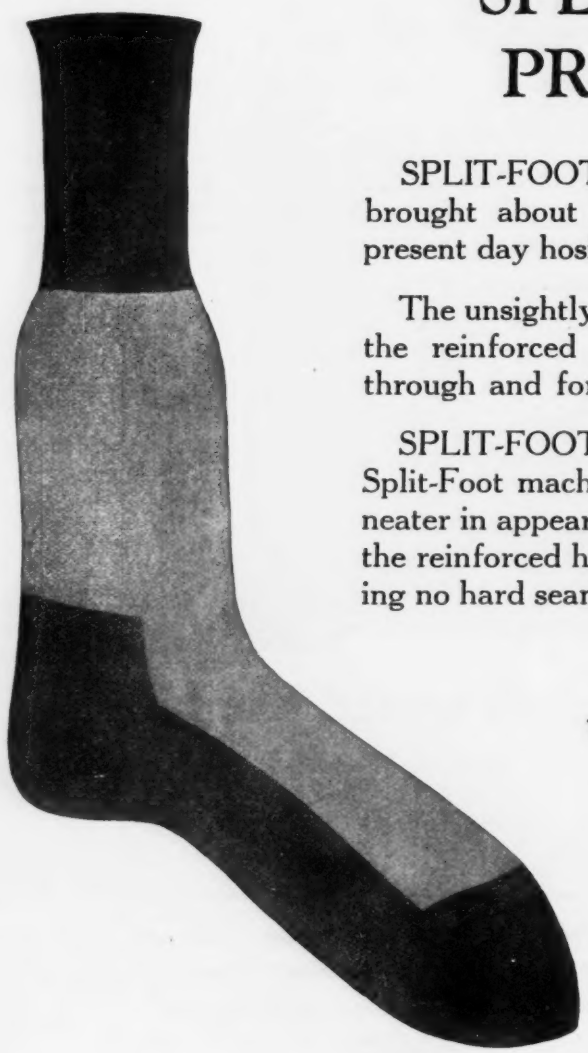
FIG. 1

the office man would then proceed to write up the order, as has been explained. The acknowledgment of the order is signed at the bottom and mailed immediately to the customer as a confirmation. The order is then held in the office until time for delivery, when it is entered in the shipping room.

The system thus is simply explained and easily operated. Its chief advantage, as before stated, is that it places the responsible work upon responsible shoulders, and relieves the shipping room operatives entirely of clerical work involving chance of error. In the plant where it was first installed, it effected a considerable saving in labor in the

The "BANNER"

SPLIT-FOOT PRODUCT



SPLIT-FOOT HOSIERY, the new creation, brought about by the main disadvantage in present day hosiery, namely:

The unsightly inside fringe of splicing ends in the reinforced portion which tends to slip through and form whiskers on the outside.

SPLIT-FOOT hosiery made on "BANNER" Split-Foot machines is smoother on the inside, neater in appearance and has added strength at the reinforced high splice and double sole, having no hard seams.

WHY MAKE AN INFERIOR PRODUCT?

WE INVITE INQUIRIES

HEMPHILL COMPANY

Main Office and Factory

PAWTUCKET, RHODE ISLAND

New York Sales and Show Rooms
350 Broadway, N. Y.

Southern Office,
James Bldg., Chattanooga, Tenn.

Philadelphia Sales and Show Rooms
Colonial Trust Bldg., 13th and Market Sts.

SHIPPING TICKET

BLANK KNITTING CO.
OSHKOSH, FLA.

SHIPPING INSTRUCTIONS

Date Sold: 10-7-24
Date Received: 10-10-24
Sold by: O. W. Rogers
Terms: 2/10 Net 30

Shipped to: T. W. Kimberly & Co., Dept. H.,
Address: 1539 W. Halsted St., Chicago, Ill.
Route Via: American Express - Paid
Date Shipped:

Date to Ship: At Once
Mill No.: 2612
Customers's Order No.: G-4720
Salesman's Order No.: 127

Case No.

STYLE	COLOR	ASSORTMENT 8	8½	9	9½	10	10½	TOT. DOZ.	PRICE	AMOUNT
65	Black		1	2	2	1				
	Gun Metal		½	½	½	½				
	Fawn		½	½	½	½				
	Beige		½	½	1	½				
	Polo		½	½	½	½		X	12 00	
450	Black		1	3	3	1				
	White		½	½	½	½				
	Burma		1	3	3	½				
	Mesa		½	1	1	½		X	8 00	

Remarks:

Packed by ..... Checked by .....

THIS TICKET MUST ACCOMPANY ANY CLAIM FOR SHORTAGE, DAMAGE OR RETURNED GOODS

FIG. 2

shipping room over the cumbersome method previously in use, and completely eliminated the cost of all forms used for the so-called packing slip and shipping ticket.

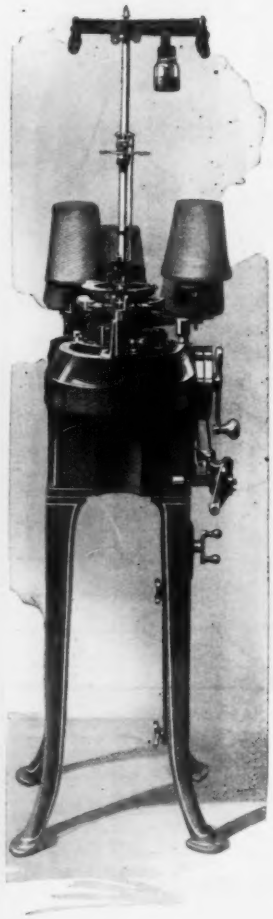
(Editor's Note.—The originator of this method has also devised an invoice which reduces clerical work and its use in connection with the order makes shipping and billing the very simpliest operation, and reduces to the minimum any chance of error. If the readers of this article are interested in simplified billing, upon sufficient request, we will be glad to publish this method.

HIGH PRODUCTIVITY

is the Outstanding Feature of

STANDARD Hosiery Machines
NYE & TREDICK Knitting Machines

The scientific production resulting from a half-century's experience enables us to offer with our machine



Simplicity

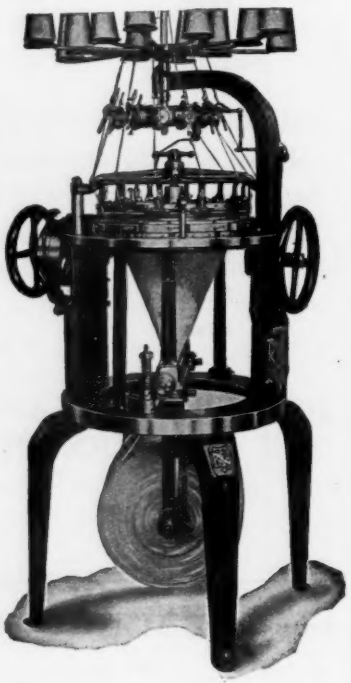
Durability

Quality Fabric

Economic Operation

Consistent Performance

Increased Production



Improvements and new attachments have been completed.

Write for complete details to the new combined concern which is offering these two well known machines to hosiery and underwear manufacturers.

STANDARD-TRUMP BROTHERS MACHINE COMPANY

FACTORY and OFFICE
Beech and Anchorage Streets, Wilmington, Del.

SHOW ROOMS
121 North Broad Street, Philadelphia, Pa.

ACKNOWLEDGMENT OF ORDER PLACED WITH

BLANK KNITTING CO.
OSHKOSH, FLA.

SHIPPING INSTRUCTIONS

Date Sold: 11-14-24
Date Received: 11-18-24
Sold by: E. P. Ennis
Terms:

Shipped to: Newton & Company, Inc.,
Address: 297 Fifth Avenue, San Francisco, Calif.
Route Via: Freight - best way

Date to Ship: January 1st
Mill No.: 4731
Customers's Order No.: H-76334
Salesman's Order No.: 152

STYLE	COLOR	ASSORTMENT 8	8½	9	9½	10	10½	TOT. DOZ.	PRICE	AMOUNT
65	Black		2	3	3	2				
	Cordovan		2	3	3	2				
	Tan Bark		1	1½	1½	1			6 87½	

Remarks:

TO THE PURCHASER:

The above is a copy of your order as entered in our factory, being our understanding of your requirements. If not in accordance with your desires, notify us by wire. Not hearing from you at once, we shall proceed as indicated. Thanking you for your order we are,

Very truly yours BLANK KNITTING CO.

By

FIG. 3

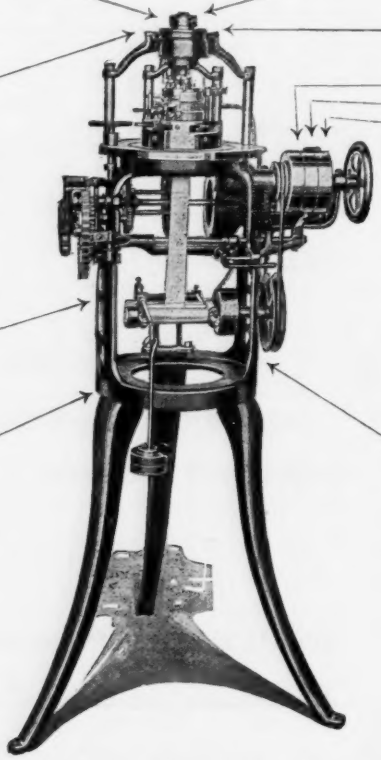
As stated in the article, the order and shipping system herein described and illustrated is now in practical operation with success and satisfaction in a well known mill.

In line with the purpose of exchanging ideas and methods, the Editors invite any readers who have in use at their plants any systems of forms or methods, by which detail and duplication of effort is eliminated, or work simplified, to submit the forms or blanks used together with information descriptive of their use in practice.

Mill names and locations, and other identifying material, will be deleted from forms before reproduction, and no reference will be made to name or location.

The

UNIVERSAL
Hosiery Ribber


Extreme ease in changing heads, any size or style from 2 3-4, to 4 3-4. Simply remove screws at top and bottom
Complete Dogless WITH NO VIBRATING PARTS
Do Not Need New Dogless when changing heads
Change head without removing dogless spider
High Speed Pulley
Low Speed Pulley
Loose Pulley
Free View of fabric from front of Machine.
One Piece frame assures rigidity.
Sensitive takeup Running in oil eliminating all wear of old Style worm and wheel giving perfect tension of fabric at all times.

Simple in Construction and Operation. Rigid in Design. Smoother Fabric.

Fidelity Machine Company

Frankford, Philadelphia, Pa.

Foreign Agents

SOUTH AMERICA
Los Fabricantes Unidos
Buenos Aires, Argentine Republic

GREAT BRITAIN
Moses Mellor & Sons, Ltd.
Nottingham, England

JAPAN
Taketaro Yoshidzumi
Osaka, Japan

AUSTRALIA
Vance & McKee
Sydney, Australia

We invite our readers to make use of this department for the discussion of any and all problems arising in connection with the knitting mill from the office to the packing and shipping departments. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. All questions will be answered as promptly as possible. The names and addresses of the contributors must be given, but will be held in confidence and a pen name substituted when printed. All accepted contributions other than questions will be paid for after publication. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

A Question on Reverse Plaiting.

EDITOR COTTON:

I wish to ask a question through your "Knitting Kinks" department and see if I can secure thereby some information on how to do reverse plaiting. I understand that it is done with the needles bent in a certain way, but while I have tried this, and get the stripe all right, the bent needles give me trouble in the heel and toe.

This is an entirely new proposition to me and I shall appreciate the cooperation of any of the "Knitting Kinks" readers in making this question more clear.

CONTRIBUTOR No. 214.

Preventing Bent Latches.

EDITOR COTTON:

Causes and remedies for bent latches on Banner machines were asked for by "F. G." in "Knitting Kinks" in your November issue.

I have had a rather extended experience in southern mills on this machine, and have had this trouble myself, and if it is permissible, I should like to give some of my own observations as to what will cause this, in the hope that it may provide additional information for "F. G." and also possibly help some other readers who are thus bothered.

There are, of course, a number of things that will cause bent latches. A man can set the finger plate so far away from the needles that the latches will hit it and cause them to bend, when the stocking is on the heel and toe. It must be kept perfectly smooth and even with the carrier ring at all times. This adjustment, properly made, may relieve this trouble.

If this is not the cause, then investigation of the setting of the latch guide should be made. If the latch guide on the back side of the carrier ring is not perfectly smooth, the latches will hit it and cause them to bend. This applies also to the latch guide on the front, which also must be perfectly smooth with the carrier ring.

Another thing that often is overlooked is the carrier ring post. If this is set so that the needles run somewhere around the carrier ring, trouble will result. I have mine adjusted so the ring is the same distance from the needles *all the way around.*

Finally, I suggest that anybody having this trouble should look to see whether the carrier ring is set down too low or not. If this is the case, the latches will hit the finger plate and cause bent latches. The way to set this, of course, is to loosen the auto carrier ring latch and tap it up until the ring just barely "clears" the latches.

These things may seem elementary to the experienced man, and may seem inconsequential and of too much detail to interest the superintendent. But "F. G." has shown us how a little thing like this can turn a man's hair gray, and I think we ought to go into these things more—nine times out of ten the other fellow will know *something* that we hadn't thought of. E. T. (GA.)

Softeners for Cotton and Cotton-Wool Hosiery.

EDITOR COTTON:

In reply to the query of "K. G. (Wis.)" I will say that the best all-around softener for cotton and cotton-and-wool hosiery is a high-grade sulphonated castor oil or soluble oil. These oils are varied for different classes of goods, emulsion oil being best for blacks, while for colors and whites a clear soluble oil gives the nicest results.

Regarding a formula for converting olive oil into a softener, the best procedure is to cut ten pounds of olive oil with one pound of soda dissolved in water, and stir this mixture into a large pail of strong soap solution. This should be used at once or made fresh every few days as there is a tendency for the olive oil to separate out. This, like all softeners, should be used in the last wash water.

J. A. B. (PA.)

EDITOR COTTON:

Replying to the inquiry of "K. G. (Wis.)" for information regarding a softener for cotton and wool hosiery, the writer will gladly submit the following, which has been and now is, used by several manufacturers of such hose.

Softener for wool and cotton hosiery stock solutions: To 50 gallons of water add—

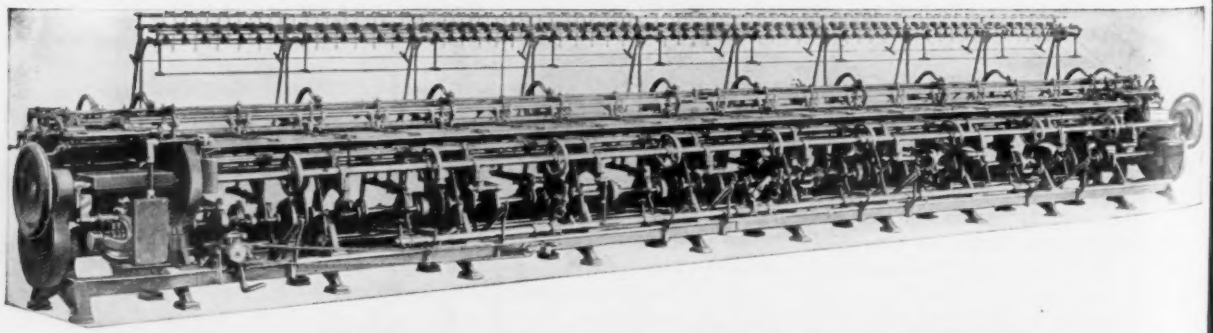
50 pounds grade A olive oil soap
5 gallons commercial olive oil
5 pounds soda ash.

BEST for the manufacture of adies' high-grade, full-fashioned, silk, hosiery.

BETTER production on a per section basis than any other machine on the market.

THIS is the machine that is used by 90% of all manufacturers of full-fashioned hosiery.

TEXTILE MACHINE WORKS
READING, PENNA.



The "READING"
FULL-FASHIONED HOSIERY MACHINE

Dissolve and boil until well mixed (one hour).

Out of this stock solution, use to each 100 pounds of goods to be softened three gallons of the softener, in a bath at 130 degrees F., and run the goods in this bath for 20 minutes; then take out the goods without washing and extract.

Should the water condition be of such a nature that it will not allow for the use of soap (as hard water will have a tendency to curdle soaps, causing flake and grease spots on the goods) then an emulsion of oils as follows would be preferable:

To a 50-gallon stock solution, add:

25 pounds olive oil

10 pounds soluble oil (sulphonated castor)

10 pounds soda ash.

Dissolve and boil.

Use from this stock solution, to each 100 pounds of goods to be softened, one gallon of this stock softener at 120 degrees F., for 20 minutes.

These softeners are good for any type of hosiery, silk, wool or cotton combinations of all kinds, the quantities to be used having to be judged largely by the local condition of the water.

I trust this will be of some value to "K. G."

A. N. (TENN.)

EDITOR COTTON:

I noticed the question from Wisconsin, in "Knitting Kinks," asking for a softener for cotton, and cotton-and-wool, hosiery; one using olive oil preferred. I can give the following suggestion for the all-cotton product, having had no experience with wool mixtures.

If the mill man has on hand a quantity of liquid olive oil (not sulphonated) I would suggest that he make a solution in a 50-gallon barrel, using three pounds of 58 per cent soda ash, filling up with water to about 40 gallons, and then heat the solution to boiling.

Then add slowly, with constant stirring, six gallons of the olive oil, filling the barrel up full, and use as needed.

A solution of this kind should be used as quickly as possible.

If the mill man's needs are not great enough to use up a barrel of softener quickly, this olive oil can be used in smaller amounts by making up in a 2½-gallon bucket, using two ounces of soda ash. Place the bucket under a steam jet and heat to boiling, and add, with constant stirring, one quart of olive oil.

This 2½-gallon bucket should be sufficient to soften 100 pounds of goods. It should be used immediately. The olive oil will emulsify readily in the alkaline solution.

H. F. A. (TENN.)

EDITOR COTTON:

I note one of your readers wants a formula for a softener to use on cotton, and cotton-and-wool, hosiery.

We have found the following to be an excellent softener for cotton hose: 25 pounds of soap (potash soap); 25 pounds of commercial olive oil; and four pounds of soda ash—this makes one barrel of softener and will soften 3,500 pounds of goods. We first put the olive oil in the barrel, and heat it to boiling point, and then add one-half barrel of water and then add the soap and then the soda ash, filling the barrel and boiling and stirring until a good solution is secured.

I am sorry I cannot suggest a formula for his cotton-and-wool hose, but I have never run any combination work of this kind.

H. F. (S. C.)

A Dyeing Problem.

EDITOR COTTON:

Here's a problem. We are running a combination of pure silk and 30s/1 double carded cotton yarn, making a men's half hose. We dye these to get various combinations—black-and-white, and red-and-black, and brown-and-white, and navy-and-white. We get along very well on all the dyeing except the navy-and-white. Our trouble comes in the rinsing after the dyeing. We leave it in the dye bath for an hour and then run the liquor off and run in our rinse water. We rinse for ten minutes, 75 pounds of goods in the tub, then run the water out and repeat the operation.

We find that in doing it this way the silk is stained with the navy blue, which spoils the effect. This might be attributed entirely to the dye used, but in the first place, it is a direct dye which is not supposed to affect silk, and in the second place, if I take a single hose from the dye bath after dyeing, and hold it under a faucet by itself, it will rinse out nice and clear.

In the bath with the dye we use soap (9 pounds to the 75 pounds of goods), phosphate of soda and soda ash.

I thought some of your readers might have had a similar experience—if so, I shall appreciate any suggestions they can make through "Knitting Kinks."

CONTRIBUTOR NO. 3669.

What Makes the Hooks Break?

EDITOR COTTON:

I have two or three "Banner" machines that every now and then seem to take a notion to break the hooks. I can't find the cause. The machines are set up so everything "clears" the hooks, so far as we can see.

They will break the hooks anywhere along the stocking for a while—and then suddenly they will stop breaking them and we won't know either what made them break or what stopped them from breaking.

If any of your readers can make any suggestions, they will be thankfully received by my fixers and myself.

CONTRIBUTOR NO. 3670.

Checking Up on Underwear Defects.

EDITOR COTTON:

The compilation of letters which you published in November "Knitting Kinks," giving the various methods for checking up on underwear defects, was interesting as presenting the ideas of the different men from all over the country.

If it would be of interest in this connection, I will tell our method for doing this, as it varies from all of those described in November COTTON. We believe we have this feature of our work down to the best way of doing it, and we noted a considerable reduction in the number of needle lines after starting this system.

In a room of approximately 150 underwear machines, we have one man, an inspector, who devotes his entire time to inspecting the cloth in process of knitting. He goes to

"Get-To-Gether"
April 6, 7, 8, 9, 10, 1925

Twenty-first Annual
Knitting Arts Exhibition

The Commercial Museum, Philadelphia, Pa.

UNDER THE AUSPICES

NATIONAL ASSOCIATION OF HOSIERY AND UNDERWEAR MANUFACTURERS

More than two hundred manufacturers and dealers in Knitting Machinery, Knitted Underwear and Outerwear, Yarns, Mill Equipment and supplies will again show their products at the 1925 Knitting Arts Exhibition.

The ever increasing number of exhibitors is sure proof that the trade goes to this market to buy and view the new devices and improvements that manufacturers and jobbers have to offer.

Old exhibitors will tell you this Exposition is the most practical, successful method of merchandising they know.

Held in connection with the annual meetings of the National Association of Hosiery & Underwear Manufacturers it affords a wonderful opportunity for buyers to attend these meetings and at the same time view your product.

If you seek to widen your market you will be represented by an exhibit at this creator of new business.

Don't miss this opportunity

The cost of a space measuring 10 x 10 *or* 100 *square feet is* $150 *and includes Sign, Floor Covering, Desk and three chairs and general decorations all ready for your exhibit.*

What better method of advertising will place you directly in touch with thousands of real buyers at so small an expenditure?

——*Apply at once*——

Personal Direction Chester I. Campbell

Address all communications to Executive Offices

329 Park Square Building, Boston, Mass.

each machine in turn, pulls the cloth out for a matter of three or four yards, and gives it a close inspection. If he finds a needle line he marks the spot with chalk and the fixer or operator is notified.

In addition to this, a bell is sounded in the room every twenty minutes during the day. This is a signal to all the operators to stop their machines, and inspect the fabric for needle lines. If the difficulty is a broken needle, and the operator can remedy it, he does so and starts his machine up again. If it is a matter requiring the attention of the fixer, he is called for the job.

As we know from which machine any roll is produced, if a needle line shows up in the inspection afterward for any length and there is no chalk-mark, we can place the responsibility on the inspector. If there is a needle line and the inspector has put a chalk-mark on it, then the responsibility is shifted to the fixer in charge of the particular machine.

There might be some objection raised at the beginning if this system is installed, but after the operators are informed that it is for their own interests as well as those of the mill, I don't believe anyone would have any trouble. We found our needle lines were reduced by some 75 per cent after we got this system working some months ago.

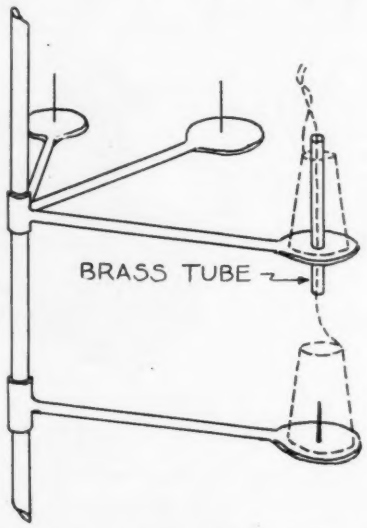
C. R. P. (TENN.)

Blending Colored Wool and Artificial Silk.

EDITOR COTTON:

The question of knitting colored wool with artificial silk to give a mixed effect, and to get the right blend in the heel and toe has been presented to the writer for solution.

Many have attempted this and given up in disgust, and yet the solution is simple. The yarns on the heel and toe should not be run side by side, but one cone or bobbin



should be placed directly under the other; first, drilling a hole through the pin hole which will have to be taken out, and large enough to insert a ⅜-inch brass tube, putting a stand under the cone above, running the yarn underneath through the tube and over the same yarn guide as the top yarn; this will twist the top and bottom yarns together, making an even blend.

BOB (CANADA)

How Can the Double Sole Be Lined Up on One Needle?

EDITOR COTTON:

I should like to present another question on hose manufacture to the readers of "Knitting Kinks" for discussion. Is there any way to line up a double sole on a Banner machine with one needle? On at least one type I know of, there is a dividing cam that comes in and holds the long butt needles up, and when the double sole drops in it is bound to catch on the medium needles and is lined up with one needle. But is there any way of getting at it on the Banner machine so it will do this? Sometimes I can get it going all right and then the next day it will be off, and I should like to know of some way to make it constant, if such a thing is possible.

G. B. F. (TENN.)

Cured His Latch Bending Trouble.

EDITOR COTTON:

You published in the November number, in "Knitting Kinks," my question about the trouble I was having with bent latches on "Banner" machines.

I am writing to thank you for your kindness and the service rendered through "Knitting Kinks," as I now have the trouble practically stopped, and bent latches are a rare thing now. I fixed my machines from the suggestions of "Old Knitter (Pa.)" which were published in the December issue, by taking out the throat or mouthpiece and beveling the edges and then giving it a thorough polish. However, I thank you and the other fellows for their suggestions, as they were all good, but I got over my trouble as mentioned, and did not have to try any of the others.

F. G. (TENN.)

A Silk Yarn Kink and an Opinion.

EDITOR COTTON:

I have read of the system of having the cones of yarn in a caged section of the knitting room, and requiring the knitting operator to bring an empty cone to the one in charge of this department, who issues a new cone for it. I have seen this plan in operation in some of the mills I have visited.

But at our plant we have a different method I will tell you about. We make a ladies' high-grade silk line, and instead of having the cones of yarn in a special place, I have canvas baskets placed behind the knitters, between the rows of machines, so all they have to do is reach back and get a new cone, without leaving their machines for even a little while. I have one boy—a utility boy—who keeps all these baskets filled.

My theory is if you establish a system which allows the operators to leave their machines, they will sort of take advantage of it, and if, for instance, the operator at one end of the room were required to walk all the way to the other end to secure a new cone of yarn, you can bet your bottom dollar he, or she, will take plenty of time in doing it. And while they are gone, something will go wrong on one of their machines—with nobody there to fix it.

Our aim throughout the entire mill is to so work out our systems that we can always definitely establish the responsibility for any kind of bad work. This, we believe, is

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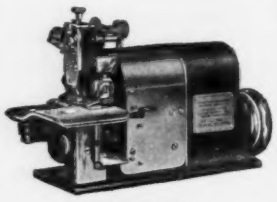

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the right line to work on. Under our system, the operator is always at his machines—or should be—and if he isn't, why, he can't say, "Yes, that bad work came off my machine, but I was away getting me some more yarn when it happened," etc.

How do we dispose of the empty cones? Well, in reality, our cones aren't entirely empty when we take them off. We have found the paste-board cones, rough in places, will break the yarn if we run off the last few layers on the machine. Therefore, we have put on the floor at the end of each line of machines a sort of tapered cone base on which the cones are stacked. The operator is instructed to run the cone almost out, then take it off and stack it on this base. The utility boy then carries these cones to the back-winding machines, where the remaining layers of yarn on the cones are re-wound onto brass or metal cones or bobbins. The result is, if the yarn, in winding off the paste-board cone, is broken, the back-winder can tie it up without the effect of bad work that would result on the knitting machine. Then the brass bobbin is filled, and placed on the machine, and all the yarn can be used off, as the polished surface of the bobbin will not break the yarn.

Another thing: I noticed in the October issue of "Knitting Kinks" that "J. D. (Tenn.)" prefers using a shallow basket to catch his work under the ribbers, while his friend was partial to a deep basket. As for me, I don't use a basket at all. I had a tinner make me a kind of pan which is fitted up under the machine to catch the oil, and the work drops down onto the floor. Thus the foreman, or myself, walking along by the ribbers, can *see* at a glance just how the work is running. The floors of course are kept clean—but of course that isn't anything to be ashamed of.

O. M. (TENN.)

Desires Some Average Costs.

EDITOR COTTON:

Through your "Knitting Kinks" department, I would like to ask what is the cost of dyeing and finishing men's and women's hosiery? I have in mind dyeing and finishing hosiery for the trade, which would probably include cotton, wool, silk and mixed goods, taking the goods from the mills in the gray and shipping them out to customers in the finished state.

Any information on the cost of dyeing, price of boarding, pressing, pairing, folding, boxing, mending, packing and supervision will be appreciated. N. S. (N. C.)

Wishes Stitch Cam Information.

EDITOR COTTON:

On an underwear machine, or for that matter on the hosiery ribber, would there be any advantage in grinding the stitch cam to such a point that only one needle would actually be held down while knitting? The way our cams are ground at present the drop is of such an angle that there are nearly two needles down as they pass the point of the cam. This seems to place an undue tension on the yarn and, I believe, is a cause of excessive breakage.

I should be glad to see this discussed in "Knitting Kinks" and it might be interesting if the men discussing it would send in sketches of the way their cams are ground, and the reason for grinding them as they do.

P. B. (GA.)

What Caused the Holes.

EDITOR COTTON:

If you have a place in "Knitting Kinks" for knitters to tell of peculiar experiences, I should like to relate one that caused us some worry, in the thought it may give a suggestion to somebody who might run into it sometime, as to where to "find the nigger in the wood-pile."

We make a ladies' silk stocking, with mercerized top and heel and toe, and use the peroxide bleach. Some weeks ago we noticed, when the stockings had come from the bleach, there would be peculiar looking holes in the tops, which looked as if they had been burned or something, having a sort of brownish-black color around the edges. These holes appeared only in the top, above the welt.

Well, it had us baffled for a week or two. We couldn't figure out what was doing it. The stockings, before going into the bleach, would, upon examination, appear to be perfect, and we didn't know anything about the bleach that could cause it. A local chemist here said it was undissolved peroxide, so we strained the peroxide through two salt-sacks, and still had the trouble. We submitted some samples of it to some "experts," and they finally came back with some general suggestions, such as rings on the boarders' fingers, rough places on the boards, etc.—but before we got their answer, I found the source of the trouble.

Going through the knitting room one day, I noticed on one machine that some of the stockings turned off had a sort of a little brown spot in the top. We experimented around in the bleach and found that all the stockings coming out with holes in them came from this machine; understand, not all the stockings from this machine turned out this way, but all that turned out this way came from this machine. We investigated further on the machine and noticed these spots, which at first we had though were smudges from the operator's fingers, or something like that, were caused by the top being pinched just as it is pulled down when the machine goes onto the welt. I showed this to the fixer, and he adjusted the machine by a simple adjustment, and our trouble with holes stopped.

Now I don't know how to explain that, except that when that top was pinched, some sort of metal touched it and a trace of it was left, making that brown spot, and when the peroxide in the bleach touched it, the chemical action made the hole right away.

So if anybody has those holes at any time, I suggest they go back and see if the stocking is getting pinched on the machine. Now somebody else tell us one.

H. B. E. (TENN.)

What Makes the Dark Streaks?

EDITOR COTTON:

We are making a half-hose of artificial silk plaited with a 70s/1 mercerized yarn, which we have to dye at a very low temperature. We dye these brown, and the artificial silk takes the color all right but the mercerized heel, toe and top take it in a lighter shade which is spotty, with dark streaks. The same dye is used. Any information the readers of "Knitting Kinks" can give as to suggestions for eliminating these streaks will be appreciated. M. H. (TENN.)

(*Continued on page* 336.)

The Yarn Market

Influences of a tangible and sentimental nature both affected the Philadelphia cotton yarn market during the first part of the past month as reported here, and resulted in an elevation of price accompanied by augmented business placed at the higher figures. The result of the national election injected confidence and a psychologically healthy tone in business circles. Business for yarn consumers improved, resulting in business from them for the yarn sellers and dealers.

A noticeable continuation of the price rise persisted throughout the period immediately following the election, indicated that for the time it was a spinners' market, and quite a bit of business of a comparatively satisfactory nature was reported.

That the prevailing influence tending toward the lack of interest in the market on the part of the yarn consuming trade has been the absence of work for their own plants was indicated by their disregard for the higher rates on desired numbers when they did ask for them. An example was the case of a user who, in one week, refused interest in a yarn number, but who came to market the next week, found the product a nickel higher than the previous week's quotation, bought to fill his requirement, and commented he undoubtedly would be back for some more later on at the same price.

During the last few days of November, however, prices began to recede again, the peak having been reached apparently, and lack of demand again was in evidence, influenced to a large extent, no doubt, by the hope of a still lower level of quotations. Another factor affecting it was that there was a general slowing up of demand for products made from yarns, and buyers were disinclined to stock up on yarns to carry them over the holiday and inventory period with nothing in prospect for their utilization. Others pointed out that a sagging demand in December was a seasonal proposition anyway. However, in cases where business for finished goods had been placed there seemed a willingness to operate ahead on yarns.

During December certain counts of yarns, following the healthful rise in rates, went back to levels very nearly approaching their low marks for the year. Combed goods seemed to hold up better than the other numbers.

Another contributing feature to the condition arising during the last month was explained by some to be the variance in ideas between spinners and buyers as to yarn values. In the face of an absent market, so to speak, the spinners were inclined to hold on to their higher quotations, feeling no harm would be done as prospects for business would not be affected anyhow, and considering this stand would place them in a stronger position later on when inquiries were more plentiful. Buyers, apparently, could not be converted to the spinners' argument that the quotations represented bare profits, if any, over operating and production costs. They seemed inclined to the attitude that based on raw cotton values the rates for yarn should come down.

A feature commented upon here last month, which was emphasized during December, was what seemed to be the elimination of the "rush-period" plan of buying. The demand for yarns seemed to be distributed over the time more evenly, and this was pointed out to be better for the mills, and also to give a steadier operation and business to the dealers.

Some factors felt, during December, that the slump in business, caused by cotton values, was influenced also by easier supplies of yarns, occasioned by undue operation at the mills to provide for anticipated business on the strength of a better market—and also for business in hand—which in a supply of yarns larger than had existed when the spinners obviously were controlling the market.

Following are quotations on the Philadelphia market on December 16:

Single Skeins.

4s to 8s	38	10s	39
12s	39½	14s	40
16s	40½	20s	42
24s	44½	26s	45½
30s	47½		

Single Warps.

8s	40	10s	41
12s	41½	14s	42
16s	42½	20s	43
26s	46	30s	49
40s	53		

Carpet and Upholstery Yarn in Skeins.

8s and 9s 3-4 slack	39
8s 3-4 hard white warp twist	37
8s and 9s 3-4 tinged tube	35
8s 3-4 hard twist waste	35

Two-Ply Skeins.

8s	40	10s	40½
12s	41	14s	41½
16s	42	20s	43
24s	47	26s	47½
30s	49	40s	53

Two-Ply Warps.

8s	40½	10s	41
12s	41½	14s	42½
16s	43	20s	44
24s	47	26s	48
30s	50	40s	56

Frame Spun Carded Yarn on Cones.

8s	37	10s	37½
12s	38	14s	38½
16s	40	18s	40½
20s	41	22s	41½
24s	42½	26s	44
30s	47	40s	52
30s double carded			48
30s tying-in			45½@46

Two-Ply Combed Peeler Skeins and Warps.

8s to 16s	55	20s	57
24s	58½	30s	62
40s	67½	40s	72½
60s	77½	70s	85 @87½
80s	95		

Single Combed Peeler Yarn on Cones.

18s	52½	24s	55
30s	60	36s	65
38s	66	40s	67

Mule Spun Carded Yarn on Cones.

10s	43	12s	44
14s	45	18s	47
20s	48	24s	49
26s	50	30s	51
40s	58		

Mule Spun Combed Peeler Yarn on Cones.

10s	52	12s	53
14s	54	16s	55
18s	56	20s	57
22s	58	26s	62
28s	63	30s	64
36s	67	38s	70
40s	72		

W. D. CARLTON has become superintendent of the Anniston Knitting Mills Co., Anniston, Ala.

L. F. MERRILL has accepted the position of overseer of spinning and twisting at the Park Yarn Mills Co., Kings Mountain, N. C.

E. M. GRANT, formerly overseer of carding at the Elk Cotton Mills, Dalton, Ga., has become overseer of carding at the Green River Manufacturing Company, Tuxedo, N. C.

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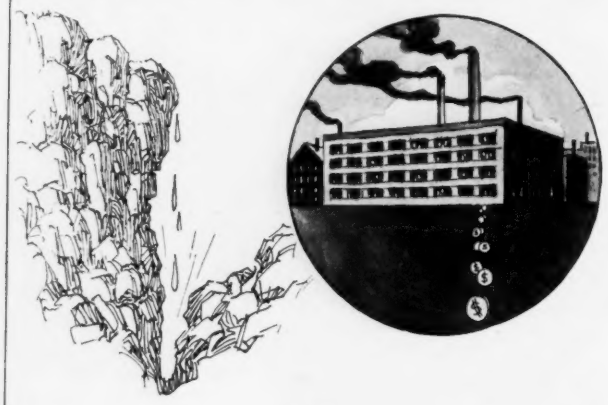

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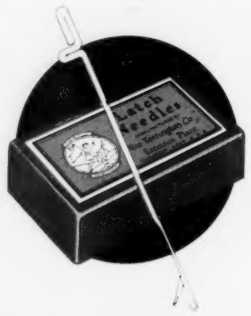

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The Knit Goods Market

Statistics, although incomplete, indicate that less hosiery of all classes was manufactured in the United States in the last half of 1924 than in the first half. Beginning with February, output steadily decreased, April showing a slight gain over March. But from that time on curtailment was the rule, as shown by figures supplied by the Department of Commerce and from private sources.

By September, mills were turning off around four and one-half million dozen pairs of stockings of all classes per month. The figures for that month were, however, under those for January, when production of about 400 knitting mills reporting approached five million dozens. Not until early Fall did manufacturers receive much encouragement. By that time stocks were pretty well depleted, curtailment had been severe and there were visions of a buying movement, which took form in September. From then on to the end of the year there were spurts of briskness, and by November retailers were buying hosiery as though having just waked up from a Rip Van Winkle sleep.

Some of the leading direct-to-retailer mills made new high records for immediate delivery business. Orders poured in upon them like an avalanche. Three large mills increased their November spot shipments by an average of more than 19 per cent over any corresponding month. Jobbers were less active, relatively, but frequently came to market with a rush for right-away goods and found mills sold up for a month or more. The increased production was not sufficient to take immediate care of all of the jobber orders.

Outstanding in hosiery statistics were figures showing a sharp increase in the manufacture of women's full fashioned silk hose. One gain over the preceding month was 31 per cent, in contrast with a gain of 11 per cent for seamless. Increases were scored by men's silk half hose, cotton hosiery as a class and women's straight artificial silk, also silk in combination with fiber. Artificial silk half hose fell off in competition with mixtures in novelty effect.

A review of the hosiery market from the standpoint of price popularity shows that full fashioned silk toward the end of last year made gains on seamless silk lines, and incomplete reports indicate that the dollar stocking leads in popularity in seamless silk lines. In this analysis stockings with a full fashioned foot on a latch needle knit leg carrying the fashion marks, are not taken into consideration. There are several makes of this type of women's silk stockings that retail at a dollar a pair, and there were indications it was growing in favor.

A well known mill in the Central West which has not employed full fashioned machines contemplates their installation, and it seems the management is planning for a full fashioned silk boot stocking for the $1.50 retail range. Whether to use 39 or 42 gauge machines was a question under consideration last month, to be disposed of soon. For a good stocking of this type some interests favor the 39 gauge, although the trend unmistakably is in the direction of 42 and finer. The matter of gauge enters into the question of the proposed retail price of the new line of stockings, which probably will make its appearance this year.

That the trend has been toward finer gauge is indicated in the increasing number of 260 needle circular machines and the greater call for 42 gauge full fashioned. This year probably there will be greater use of artificial silk in combination with Japan silk as a cost expedient, and a good circular knit stocking of this construction to sell in a general way at less than a dollar a pair and full fashioned at under $1.50 seems likely to be one outcome of the keenest competition ever.

According to one authority on silk, the use of artificial silk for hosiery purposes has cut deeply into Japan silk, to the extent of almost 30 per cent. Combination of the two fibers, it is believed, will be resorted to more generally this year than last, when improvements in the manufacture of artificial silk were a large factor in its greater use for hosiery. In fact, there is an indicated strong trend toward artificial silk with a cotton base. As cost of yarn or thread is reduced by improvement in the artificial it is believed its use will be materially expanded, and that manufacturers will find combination with tram very desirable as a price expedient. At all events, it appears that with the progress being made in the manufacture of artificial silk, Japan will not find it so easy to manipulate her market for the fiber.

It was observed last month that many mills were hesitant to contract far ahead for Japan silk, as if looking for a decline in the market. Some few have bought for prospective needs to April, these being a very small minority. There were large holdings in New York warehouses in December, and it appeared to be coming in faster than it was passing to mills.

Full fashioned silk hosiery was selling by mills last month at advances of from 25 cents a dozen pairs. Manufacturers owning silk bought down at the July price, around $5.25 basis of double extra A, were getting prices based on silk costing a dollar a pound more. At that time, of course, there was demand for holiday hosiery, and for a while price was not so much a question with distributors as favorable deliveries. The Berkshire Knitting Mills led in the higher price movement, such mills as the Oakbrook, near Reading, Pa., and the larger ones in Philadelphia coming along with somewhat higher prices, the increase being hardly sufficient to take the stockings out of the retail price range.

By reducing the weight of a silk stocking and having recourse to economies in manufacture, mills making full fashioned silk hosiery scored gains on the seamless that, it is thought by some factors, mean the flat knitted will this year crowd hard on the product of latch needle machines, to say nothing of the preference in many quarters for the spring needle goods. The latter are being sold heavily by a few mills to chain retail stores, which have become an outlet eagerly sought by manufacturers. Yet 50 per cent of 100 retailers, who were questioned for trade purposes, say they do not distinguish between the spring and latch needle goods. Improvements in latch needle machines are so rapid that it seems difficult to conceive the possibility of making further inroads on their product, particularly as price is a controlling factor in consumption.

But here enters the question of the extent to which the South will engage in the manufacture of full fashioned silk hosiery. The product of one southern mill, selling at $12.50 for 12 strand, is in strong favor in competition with northern product of 11 strand priced at $12, it is stated by a

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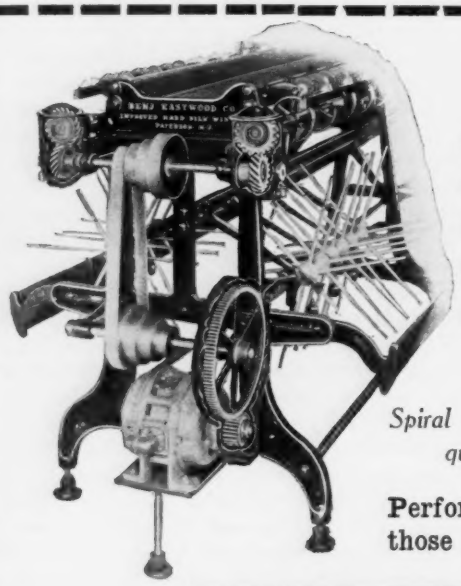

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leading commission house distributing the output of the southern mill. Southern-made full fashioned is making headway, it is apparent to market observers, and that silk this year will crowd harder than ever on cotton hosiery, is the outlook.

Hosiery mills owning low price raw silk are getting prices based on current cost. They were able to do this during the holiday demand, and some that have not paid a dividend in several years expect to make a distribution among stockholders this year. Had silk declined, it cannot be disputed, mill prices would have softened. For the first time in a long while mills were able to sell at current value, and having moved prices up, no recessions are looked for unless as a result of broader use of artificial silk in combination with tram. Of course full fashioned prices will have to be held down to a level where spring needle goods cannot compete successfully, and the cost of high grade artificial silk hosiery will be an important factor in the progress of both full fashioned and seamless made. At the moment the trend is to full fashioned, with which both latch and spring needle goods will have to contend as must the more modern cotton hosiery with silk.

The production of artificial silk boot hosiery appears to have been overdone, as indicated by price competition, confined more particularly to the poorer grades, however. It is known that several southern mills have sold for the first quarter of the year, at the market. These manufacturers go on the theory that at the comparatively low cost of artificial silk it were not wise to skimp in gauge or length of boot. A jobber was in the market last month for a 17-inch boot at $2.50 a dozen, $2.65 being quoted. Probably there are manufacturers willing to construct a stocking at such a price as was offered, but for a long pull it would have hard sledding. The trade that buys in a big way wants the best fiber silk stocking that can be made. The overproduction of artificial silk hosiery can be held responsible for offerings of sub-standard goods—at a price.

Novelties in the better grades of silk hosiery seem to have afforded an inspiration for applying embellishment to low price goods by a less costly process. For example, hand embroidered designs, such as roses, vines, and birds, an inch or two below the knee of women's silk stockings, supplied an incentive for a hosiery expert to experiment with a process by which the cost, it is estimated, can be reduced by 80 per cent. This process contemplates all the colors in hand embroidery and goes printing one better, in that colors are said to be brought out more sharply. It still is in an experimental stage, but several manufacturers to whom it has been submitted look upon it with much favor.

Novelties are a precarious proposition for manufacturer and distributor, and one trade authority urges retailers to stock up very lightly with them. It is pointed out that the more fetching innovations often have the shortest existence, as once they become common there is, obviously, a class of trade that passes them by. While novelties have been a large part of the hosiery business for some time, and will be seen next spring and summer in no less profusion than last year, they seldom are bought heavily, and volume production is looked on as dangerous. There are some innovations that stick, and become staples, children's fancy top derby ribs in seven-eighth length, for example. But some of the staples in this class last year will be passed by the end of the season, as is indicated by the facility with which patterns can be changed. The crochet stitch and jacquard weave for tops have had a good and profitable run, but last year a few mills cut prices when they were not getting what they thought was their share of the business. That there will be new top designs for the next season, is a foregone conclusion. The ribs will stay.

It is understood some interests contemplate individual patterns for various distributors and localities, an innovation that has been simplified by facilities for knitting any design that can be put on paper and punched into cardboard. The machine that does this does not knit stockings, but it is knitting, in at least one large mill, cloth from which the leg and upper part of the foot of golf stockings are cut. It is easily conceivable that this process of putting patterns in hosiery can be materially expanded. For the present there is big jobber demand for printed hosiery, and a Philadelphia establishment specializing in this class of ornamentation is crowded with orders from scattered mills, from New England to the Middle West, from which it may be deduced the trade is preparing for another pattern season. Knitted-in-stripes, it appeared for a time, were superseding diamond and rectangular plaids, and it looks as though the stripes will be well to the front for Spring and Summer, in mercerized and mercerized in combination with artificial silk.

"Will women's ribbed mercerized hosiery hold the ground it gained last year?" is a question in the trade. It is believed the ribbed-to-toe is good for a long run, but latterly there has been an urge from some jobbers for silk-and-wool hosiery of flat construction, to retail at a dollar a pair. The preference for the flat possibly could be ascribed to its lower cost, as the big business in wool goods was in the dollar class. With the approach of winter there was demand for hosiery of this description that caught mill and jobber illy prepared to meet. Leftover stocks from the preceding heavy weight season were disposed of in boom time order. A mill which carried over more than 7,000 dozens sold the entire lot without trying, and if it has a dull period this year will make up a hundred or more cases in preparation for early call with the swing from Autumn to Winter. Generally speaking, manufacturers are skeptical of wool hosiery for women, foreseeing, however, another brisk season for half hose of this construction.

Last year's curtailment of production of cotton hosiery in the lower price ranges worked out to the advantage of some of the large mills favored with volume output and low overhead. A Georgia establishment, the Rome Hosiery Mills, had a record Fall month business, according to John M. Berry, who divides his time between the mill and his New York office, occasionally selling on the road. At times several departments of the mill were being operated overtime.

It would appear that in cotton hosiery the situation is more satisfactory, from the standpoint of price, in low end goods as one extreme and ribbed mercerized as the other. Plain mercerized is priced under value. Women's 220 needle with seamed back and double sole, as low as $2.10 a dozen for spot delivery, and men's first rate goods at $1.55-$1.60 for full mercerized. Mercerized of not as good construction was in fair demand for export. Misses' plain mercerized ribs seem to be not commanding a price commensurate with cost, due no doubt to the craze for fancy top goods. Mercerized and artificial silk hosiery continues in fair demand for export.

To the astonishment of some interests, prices of misses'

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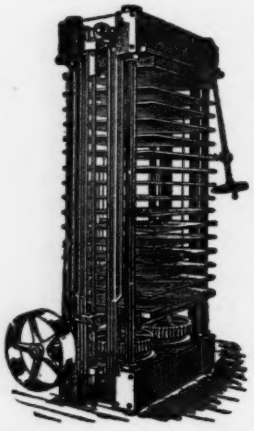

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FOR

Hosiery and Underwear

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Mercerized Yarns

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20/2-80/2 Natural and Gassed.

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combed ribs were advanced a few cents a dozen by a manufacturer here and there. A southern mill, sold up to February at $1.65, last month was quoting five cents higher for new business. Coarse gauge carded ribs seem to be not in big call, as low as 97½ cents a dozen being quoted for goods weighing 28 ounces on size 9. A chain of five-and-ten-cent stores is reported having bought heavily of combed ribs at a price less than $1.60.

A chain of retail shoe stores is selling a Pennsylvania line of pure silk half hose with mercerized top at 60 cents, a reduction from the price of a few months ago. The chain operates 90 stores and therefore is a good outlet for men's hosiery. A large mill in Reading, Pa., is reported running strong on each of three numbers of novelty half hose—one of Japan and artificial silk, one of artificial silk and mercerized and one of artificial silk and cotton. In the latter number the fiber silk is used for striping and getting a two-tone effect.

The hosiery primary market closed last year a trifle groggy, leaving out of consideration silk and novelty lines for the holiday period. The sagging last month seems to have been indicated in announcement of lower prices for certain staples for Spring and concessions here and there for coaxing immediate business. Some mills were fairly well engaged on Spring orders, but jobbers were operating cautiously in the pre-inventory period. Their spot orders were frequent and so small that it was apparent there was a determination to work toward inventories showing bank balances and minimum stocks of goods. Nor were buyers contracting heavily for this year. There appeared some uncertainty as to how 1925 might start. The fact that jobber and retailer closed the year with practically empty bins and shelves was taken to mean, however, that the then coming year would show an improvement—for mills—over 1924.

It was freely predicted in primary market circles that 1925 will witness a tendency to shortening the route from hosiery mill to the consumer of hosiery, and that jobbers, unless they at once begin functioning, by carrying stocks, will see more of their business passing. Jobbers complain, and many manufacturers do not deny, that numbers of mills assumed to be selling to jobbers exclusively are letting retailers have goods at but little above what jobbers pay—in a way building up a direct-to-retailer business without going through the formality of organizing a selling force. Some of the business from that quarter comes through several organizations, small, but growing, which solicit retailer accounts. Such an organization was in the market last month for silk hosiery for the retail trade, simplifying matters for mills weary of jobber procrastination.

It is no secret that some of the busier mills were selling to chain retail stores only, and the accounts of catalog houses were especially desirable. What these establishments have done in crowding on the rural retailer, who ordinarily is a patron of the jobber, is being repeated by mills selling to consumers direct through canvassers, some of whom are in the federal income tax paying class. There is instanced a woman canvasser for hosiery and women's underwear whose weekly earnings run from $60 to $75. One direct-to-consumer mill is paying as much as $10,000 a year to managers of districts in which canvassing by bell ringers has become a well established business. One of the better known direct-to-consumer mills which for some years supplied only women's hosiery now is operating extensively in half hose, and it goes without saying that others will follow.

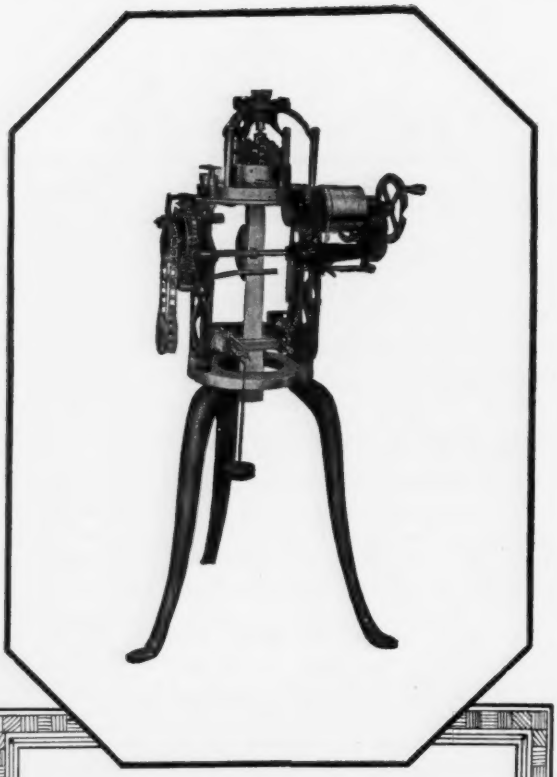
So serious has the matter of direct selling become as a factor in the apparently declining business of hosiery jobbers that the National Wholesale Dry Goods Association recently sought the views of a few of the more important houses on the question of how best to deal with jobber mills "selling to retailers by back-door methods." Whatever the outcome of the informal questionnaire, it seems certain manufacturers will find an outlet for their product, by one route or another, and by each of several, perhaps.

Jobbers doubtless will continue to dominate in commonplace staples, barring considerable business with chain retail stores. But the outlook for them will not be improved if they continue last year's policy of trying to do business on stocks in mill warehouses, to be shipped out to them as retailer orders come in. It may be significant that considerable underwear, more especially in silk and artificial silk in combination with cotton, is passing direct from mill to consumer through busy canvassers.

When a number of the northern heavy weight underwear manufacturers came out with 1925 prices on December 15 there were indications of very keen competition between the North and the South. It was not, however, a general opening of northern lines, as some mills supplied no prices. The one-time formality seems to have been a sort of go-as-you-please affair. As a matter of fact, several manufacturers had been selling in a quiet way previous to the so-called opening. A few jobbers were permitted to place orders, while in at least one instance a buyer who asked for quotations was told prices had not been named. There appeared to be some mystery in the way scattered manufacturers in New York State were coming on the market. Buyers seem to have sensed there was lack of cohesiveness among mills, numbers of executives being suspected of indecision.

Some days before the not well arranged opening, the Blood Knitting Co. had gone southern mills one better in the matter of price and delivery periods. Then on the day designated for showing buyers what mills had to offer, the Bailey Knitting Co. astonished the trade with a quotation of $10.50 on a 14-pound randon suit made on spring needle machines, for deliveries June to August, terms 10 days net, 60 extra. Low marks for the northern division also were established by the McLaughlin Textile Corporation. It would appear that the two big Tennessee mills and the P. H. Hanes Knitting Co., Winston-Salem, N. C., and the Mayo Sales Corporation, selling the output of The Washington Mills, Mayodan, N. C., previously had set the price pace, when they came on the market in November. The latter came out soon after its opening with announcement the mill was sold up for the early period. The Hanes at the time named quoted for only the first quarter of the year.

Up to the middle of last month, buyers said, it was difficult to "get a line" on the mills, and some said they looked for the placing of no large contracts before January. Several manufacturers had used the long distance telephone rather freely some days before the opening with a view to persuading buyers to be there, and there was a fair show of response. The extent to which they operated was not divulged by either seller or buyer. The latter was not wholly pleased over the apparent looming of what some said looked like an underwear war. Mill heads and some buyers as well said they felt certain no such thing was in sight. There was, however, some uneasiness over the situation as it appeared to critical observers.



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Built in all sizes for all classes of rib work.

We also build hosiery knitters and Body machines for underwear and various other circular machines for all kinds of knitted articles.

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Increased Efficiency

Cotton mill owners can increase the efficiency of their operatives by planting Peach Trees in the yards of the mill village homes. These trees will furnish an item of diet that maintains good health. They will pay for themselves many times over in increased mill output.

We can supply varieties that bear fruit from early summer until late Fall. Special prices on lots of 500, 1000 or more.

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THE STANDARD IN QUALITY - THE FAIREST IN PRICE

It will be unfortunate if manufacturers do not get together on common ground for taking full advantage of the strong market that is in prospect. At the highest price named by any mill, knitted underwear is cheap, leading buyers for some of the larger jobbing houses say. There has been no doubt for some time that neither retailer, jobber nor manufacturer will carry any 1924-5 underwear into the next season. Stocks were reduced for the inventories, in the first place, and retailers were adhering very closely to the policy of buying for needs from week to week. At times last month and in November certain desirable numbers were scarce, and everywhere assortments were badly broken, it developed, with the result sales were lost to both jobber and retailer. Distributors learned a lesson in the shortage of wanted goods that should operate to the advantage of mills this year, in that commitments probably will not be so long deferred.

With the larger southern mills openly on the market for 1925, the Icemorlee Cotton Mills, Monroe, N. C., was in the procession with those Mohawk Valley establishments who put their samples on the counter. The Icemorlee quoted $10.87½ a dozen for 16-pound cotton ribbed union suits, May to August, 10 days net, 60 extra. To that time the fleeced underwear mills had not named prices, but it was understood they would do so well before the end of the year.

The Appalachian and Standard Mills, Knoxville, Tenn., and the Mayo Sales Corporation are credited with having booked volume business days before the northern manufacturers were openly on the market. Their sales were, in great measure, for the early months, buyers taking advantage of the lower prices prevailing for that period. It is stated that some southern jobbers who have yet to place initial orders for Summer weights contracted conservatively for Winter lines. Western buyers also have operated quite freely in popular numbers, but, so far as could be ascertained, New York, Pennsylvania, Maryland and Ohio distributors were proceeding very slowly.

While the trade looks for a big underwear year, all interests starting with fresh stocks, and prices regarded low on cotton down to 21 cents, the intimation has been heard that northern mills will undertake to balance output with jobber commitments; that, while manufacturers will seek to avert closing their plants in the event buyers jog along as they did last year, there is to be no accumulating of stocks. Last year's more profitable business came late, when the trade was calling for goods. Of course the business for the year as a whole did not measure up well, as Spring and Fall climatic conditions were out of line with the calendar. It so happened that dealers had Spring and Summer goods when heavy weights were being worn, and their Winter lines were on the counter while the public still was getting along comfortably in garments of the athletic type. So this year, it seems probable, retailers may not trust the seasons to the extent they might have confidence in prices and the general all-round better conditions in the commodities markets. But the jobber doubtless will operate further ahead of the retailer than was the policy last year.

Distributors are by no means plunging on underwear for Summer. A common estimate credits jobbers as a body with having contracted for 50 per cent of prospective requirements. This seems extravagant, in view of the fact few jobbers have bought hosiery further ahead than to the end of March and that a well known mill selling its branded lines of underwear direct to retailers, to last month had booked less than 20 per cent as much business as to the corresponding date in 1923. However, some of the light weight mills owning comparatively low price yarns when they came on the market are known to be right well supplied with orders for deliveries to April. Jobbers could have bought more advantageously in October, and it looks as though some will be out of luck in relation to their supplies of Summer underwear.

Sweaters have not had a brisk market since the opening of most all mill lines for next Fall and Winter. While worsted yarn prices are high, but have not reached the peak, judging from the strength of the wool market, jobbers intimate they expect mills to make price recessions. Sweaters, however, are a style proposition, and jumbo and shaker lines seem to have been leading in sales. Business is going to the comparatively few mills whose lines strike buyer fancy. Staples are dragging, and as a general proposition, sweaters are showing less life than either hosiery or underwear.

Among the Knitting Mills.

The Smith Hosiery Mills Company, 1300 McCaulie Avenue, Chattanooga, Tenn., formerly the Wardlaw Hosiery Mills, are considering an extensive addition to the plant, to cost in the neighborhood of $100,000, it is reported.

Campbell Knitting Mills, Jellico, Tenn., have awarded contract for 150 additional knitting machines.

Star Hosiery Mills, Spartanburg, S. C., have purchased 100 new knitting machines for installation in their local plant, according to report.

Lansdale Silk Hosiery Company, Lansdale, Pa., have announced plans for the erection of an addition which will give an extra 5,500 square feet of manufacturing floor space.

Forty knitting machines, to double the capacity of the plant, have been ordered by the Catawba Knitting Mills, Rock Hill, S. C. This company recently took over the Liberty Hosiery Mills Co.

The Sierra Silk Textile Co., Los Angeles, California, has purchased a five-acre tract of industrial property near La-Verne, and will erect a knitting mill for the manufacture of men's and women's silk hosiery. Contracts have been let. M. H. Merrill & Co., of Boston, are the engineers.

Contract for an addition to the Revere Knitting Mills, Malden, Mass., has been let. It will be of one-story construction, adding 7,000 square feet of floor space.

The Charlotte Knitting Company, Charlotte, N. C., is installing new machinery for the manufacture of women's full-fashioned hosiery.

Skyland Hosiery Co., East Flat Rock, N. C., are installing additional machinery to increase their output of men's cotton and silk hosiery.

Gould Knitting Mills Co., Cleveland, Ohio, has started the manufacture of novelty and staple sweater coats. Initial equipment consists of 12 knitting and 18 sewing machines. Dan Gould is president and superintendent.

Paducah Hosiery Mills, of Paducah, Ky., are installing 40 new machines, including 25 ribbers, at its branch plant in Benton, Ky.

Claussner Hosiery Co., Paducah, Ky., are installing additional machinery, according to report.

Evenknit Hosiery Mills, Bay City, Mich., have plans for the erection of a new two-story building, 50 x 100 feet.

Interests represented by S. D. Bausher and John B. Lesher, manufacturers of underwear and hosiery, have been experimenting for some time with women's seamless silk hosiery, and are reported having leased a factory building in Frackville, Pa., to be equipped for making a high grade stocking. One sample shown is of 270 needles, of around 11 strand silk, which would have to be sold at not less than $1.25 a pair in retail stores. Hosiery interests look askance at anything in seamless lines to be sold at over one dollar, as there is on the market, at that price, a silk stocking with full fashioned foot and seamless-made fashion-marked leg, and no end of latch needle dollar lines, with spring needle goods in the $1.25 retail price range. Mr. Bausher, besides being interested in several underwear mills, is an extensive manufacturer of infants' socks. Mr. Lesher operates, at Williamstown, Pa., the Unrivaled Hosiery Mill, which is gradually getting into operation after a strike of several months.

Brownhill & Kramer, Philadelphia, building an addition to their full fashioned plant, will install 42 gauge machines and scrap their 36 gauge. To have sold them, it is pointed out, would have left them to go into some mill competing with 39 gauge, operating for volume production. While the trend is strongly to 42, the 39 gauge stocking is favored as a price expedient.

Allen Brothers Co., Ltd., Toronto, Ontario, Canada, were buyers of dyeing machinery in Philadelphia last month and at the time were negotiating for knitting machines. It is reported the company will this year run strong on colors in half hose and infants' socks.

Norma Knitting Co., operating 20 full fashioned machines on women's silk hosiery, are liquidating and already have sold the knitting machines to a manufacturer of neckwear, who is rebuilding them and, it is stated, expects some will be set up in a Philadelphia hosiery mill. The Norma Co. was in business eight years; made money during six and suffered losses during two. They disposed of the full fashioned machines at their cost eight years ago, when they were rated among the oldest in Philadelphia.

The Rockford Knit Wear Mills, New York, recently organized by M. Lippman and H. Felsenfeld, plans for the operation of a local works, for the manufacture of a line of knit goods. The company will operate with a nominal capital of $5,000. It is represented by Belfer & Belfer, 367 Fulton Street, Brooklyn, N. Y., attorneys.

The Fern Knitting Mills, Inc., West New York, N. J., recently chartered with capital of $50,000, is said to be perfecting plans for a local knitting mill, and will soon begin operations. Louis Shifrin, 568 Tenth Street, heads the company.

The Lehigh Silk Hosiery Mills, Philadelphia, Pa., will break ground at once for the construction of a new dye house and boiler plant at Butler and Jasper Streets, to cost approximately $55,000, including equipment.

The Marlou Knitting Corporation, Utica, N. Y., has been organized with a nominal capital of $5,000, to operate a local plant, for which arrangements will be made at an early date. The company is headed by C. L. Harvey, J. D. Hudson and A. L. Evans. It is represented by Miller & Hubbell, Utica, attorneys.

The Trajoh Knit Fabrics, Inc., St. Johnsville, N. Y., recently formed with capital of $40,000, will operate a local mill for the production of knit goods, etc. The company is headed by C. F. and J. J. Johnson; it is represented by W. J. Crangle, St. Johnsville, attorney.

The K Textile Co., Reading, Pa., recently chartered with capital of $50,000, is reported to be considering the establishment of a knitting mill in this section. Harry S. Deen, Reading, is treasurer.

The Evenknit Hosiery Mills, Bay City, Mich., have broken ground for the construction of a new plant on local site, to be two-story, 50 x 100 feet, estimated to cost close to $25,000.

The Berkshire Knitting Mills, Inc., Reading, Pa., is increasing capacity at its plant and has made a number of additions to the working force. About 2,150 employees are now engaged on a full time schedule.

The Real Silk Hosiery Mills, Walnut Street, Indianapolis, Ind., has awarded a general contract for the construction of a new dye house addition, to be located at Walnut and Cincinnati Streets, estimated to cost $50,000.

The Falik Knitting Mills, New York, recently chartered with capital of $15,000, have arranged for the operation of a plant on leased property at 111-13 Bleecker Street, with initial production to be devoted for the most part to knit outerwear specialties. Abraham Falik heads the company.

The Belle Claire Mills Co., New York, has been incorporated with an active capital of $20,000, to operate a local knitting mill, for the manufacture of hosiery. It is expected to begin operations at an early date. The company is headed by H. P. Belsinger and J. M. Herzberg. It is represented by B. W. Davis, 342 Madison Avenue, New York, attorney.

The Franklin Knitting Mills, 511 East Seventy-second Street, New York, are considering plans for the establishment of a branch plant in eastern Pennsylvania, for the manufacture of hosiery. A building at Reading, Pa., is now under consideration. It is proposed to arrange for machinery and begin production at the earliest possible moment.

The Meinig Hosiery Co., Reading, Pa., recently organized with a capital of $2,000,000, is reported to have plans under advisement for the construction of a new local mill for the manufacture of hosiery and other knit goods. The initial plant is estimated to cost more than $175,000, with equipment. The new company is headed by E. Richard Meinig, head of the E. Richard Meinig Co., Reading, with local plant for the manufacture of underwear, etc.

The Grayslee Knitting Mills, 111 Prospect Avenue, Irvington, Newark, N. J., have filed notice of company formation, with purpose to operate a local mill for the manufacture of a line of knit goods. Charles H. Graessle is head of the organization.

The Astor Knit Wear Co., Brooklyn, N. Y., recently formed under State laws, with capital of $50,000, will operate a local mill, for which it is expected to consummate arrangements at an early date. The new company is headed by M. Schwager, R. L. Schafer, and H. S. Landu; it is represented by Furst, Schwartz & Schwager, 215 Montague Street, Brooklyn.

The Hall-Craft Hosiery Co., Jersey City, N. J., has been organized under State laws with capital of $66,666, to operate a knitting mill in this section, for the manufacture

A DEATH in a factory increases compensation insurance. The loss of a trained workman, even for a day, slows up production.

FALLS are responsible for the highest percentage of fatalities and lost time claims.

Installation of "Feralun"

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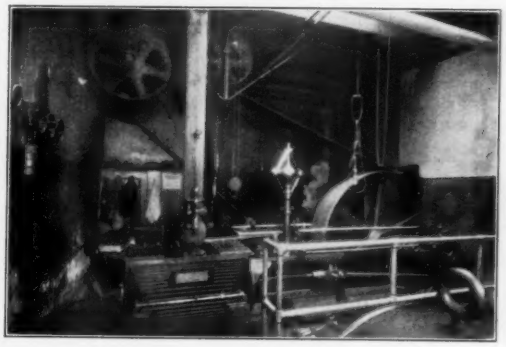

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RHOADS TANNATE

It is a leather belt of special tannage, flexible, tough and long lived. It resists heat, acid fumes and machine oils. It has such strong pulley grip it easily carries 20% more overload than best oak belting. It keeps your machines running at full capacity, assuring maximum output.

This strong pulley grip also permits an easy drive with less friction on your bearings, saving trouble and power.

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IS YOUR BUSINESS PROFITABLE?

Mr. John Nash McCullaugh, Industrial Manager of the National Association of Hosiery and Underwear Manufacturers, says:

"...big mill that ... will drive the little one out of the business. The single item of buying the right kind of yarn is often the difference between a profitable business and a losing one. This is a whole subject in itself and ... concerning which we ...

The **right kind** of yarn is yarn that makes the right kind of fabric with the minimum of waste production.

In order to meet this requirement, the yarn must be evenly spun. There are specifications like grade and twist which can be controlled by the buyer, but evenness of spinning is a test of manufacturing efficiency which the manufacturer of yarn alone controls.

Profitable operation of your plant requires discrimination in favor of spinners who can supply evenly spun yarns. If you are not satisfied with the results from yarn that you are now using, ask one of our salesmen to call and arrange for a sample order. "One example is worth a thousand arguments.

WILLIAM WHITMAN COMPANY, INC.

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BOSTON PHILADELPHIA AMSTERDAM, N. Y.
NEW YORK CHICAGO CHARLOTTE, N. C.

of general hosiery and other knit goods. The registered office is at 15 Exchange Place. The company is headed by Robert H. Laird and Marcus E. Donnelly.

The Seneca Knitting Mills, Seneca Falls, N. Y., has arranged for an increase in its capital from $125,000 to $195,000, with 350 shares of common stock, no par value, to provide for proposed expansion in operations.

The Rollins Hosiery Mills, Des Moines, Ia., will proceed with the construction of a new one-story addition to its plant, 65 x 100 feet, to be entirely for increased production, to cost approximately $55,000. The company is advancing manufacture at its plant, and plans to have the new structure ready for service at the earliest possible date.

The Rhode Island Knitting Co., Woonsocket, R. I., has completed plans and will secure estimates of cost for the construction of a new two-story mill on site selected on Avenue C. It is estimated to cost close to $30,000. Oscar H. Drouin, Woonsocket, is architect, in charge.

The Kauffman Knitting Mills, Inc., care of the Colonial Charter Co., Ford Building, Wilmington, Del., representative, has been chartered under state laws, with capital of $100,000, to construct and operate a knitting mill.

Knitting Kinks.

(*Continued from page* 323.)

Who Will Answer These Questions?

EDITOR COTTON:

I would like to ask some questions: What is a remedy for stitches riding the sinkers on a Standard B 176-needle, 3¾-inch machine, just passing out of the heel.

What will cause cut holes in the gore of the heel, and what will make holes in the back corners of the heel and toe? And how can this be prevented?

I shall be glad to have some reader of "Knitting Kinks" tell us something regarding these problems.

J. K. L. (N. C.)

A Problem and Its Remedy.

EDITOR COTTON:

I am glad to see you have a department in COTTON, known as "Knitting Kinks" where we fellows can discuss our problems. It isn't often that we knitting mill superintendents have an opportunity to talk things over with one another as the cotton mill men do—I wish we had some kind of meetings where we could "make testimony" like they do. In the meantime, however, it would be fine if the knitting men would utilize your department to discuss the things they are interested in.

In that connection, I thought I would tell of an experience I had when I first began to operate "Banner" machines; of a problem I had and how I solved it. One of my biggest difficulties was in having the needles slide out as they came up the cam when the machine was working on the heel and toe. I fussed around by myself, and finally remedied this by making certain that all the needles were put in perfectly straight and uniform, and then I ground the cams so that the needles would rub on the inside edge—in other words, the cams were ground slanting down toward the outside edge, the inside being higher. I found this helped me greatly on this point.

"Old stuff," did somebody say? Maybe so, and yet maybe not, because we never know who is going to run up against, for the first time, a problem that we ourselves solved long years ago. And I know if I could have read that suggestion from a man who said it worked when I first encountered this trouble, it would have saved us quite a bit of worry. A. N. (GA.)

What Causes the Pucker?

EDITOR COTTON:

We have been producing a French welt on a double-feed ribber. I find when transferring the tops, the loose course as it goes around the top does not "meet," so to speak, there being two stitches between the ends of it. This of course causes a "pucker" on the transfer ring. I should be pleased if some reader of "Knitting Kinks" will tell how to overcome this, if it is at all possible. H. A. T. (GA.)

Artificial Silk.

Sales of artificial silk in the first six months of this year totaled 17,264,582 pounds against 35,380,000 in the full year 1923. From present indications production in the United States this year will be approximately 40,000,000 pounds, according to Bertrand A. Clarke, of the Tubize Artificial Silk Co. Improvement in silk hosiery trade as well as the broad silk trade point to a larger use of artificial silk in the last six months of the year. In view of the dullness prevailing throughout the silk trade during most of 1924, the stability of artificial silk consumption is notable.

European production and consumption of artificial silk so far this year has been far ahead of the 1923 volume which was approximately 65,000,000 pounds.

Production of artificial silk in the United States in recent years compares as follows with consumption of bales of real silk:

	Art. Silk Lbs.	Bales Art. Silk	Bales Real Silk Cons.
1924.....	*17,264,582	.....	165,078
1923.....	35,380,500	248,000	358,000
1922.....	24,406,400	199,100	367,600
1921.....	15,000,000	140,000	334,600
1920.....	8,000,000	73,900	222,700

* Six months.

World production and consumption of artificial silk is now far in excess of the consumption of real silk outside the Orient and some authorities state that world consumption of artificial silk is nearly double that of real silk, a startling situation in view of the short time during which this new textile raw material has been in general use.

Every year its uses are expanded into new fields. The silk hosiery trade is still the largest consumer but increasing quantities are being used by the broad silk, cotton and woolen goods mills. Artificial silk yarns are twisted with other textile yarns to give luster and variety to cloth.

The most important of the new developments is in knitted cloth for underwear which is growing rapidly in volume. Other new fields are in the drug trade in rubberized silk cloth for surgical dressings, in automobile tire fabric for trimmings and beading, and as insulation for electric wiring and electro magnets.